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# DATA STATEMENTS

## Lighthearted Pleasures

Although this isn't really the time of year for masses of games releases there are still quite a few new titles around for you to choose from.

*Sky Runner* for the C64 from Cascade Software (£9.95 cassette, £12.95 disk) is a futuristic game which deals with drug wars. The drug is Sky which makes the population completely docile. Your job is to terminate the drug harvesting operation and thus free the populace from their soul destroying enslavement.

According to the authors the game was inspired by such movies as *Dune* and *Antes of the Ark* and is the culmination of several months' work. It was launched in the new year.

On a completely different historical level, *The Three Musketeers*, a new game from Swedish Software House, Computer Movers. The new game is available for the C64, C128 (with enhanced graphics) and the Amiga. Tape version is priced at £9.95, the 5-1/4" version on disk at £14.95 and there is even a 32-bit disk version at £24.95. The well known *Three Musketeers* story is the theme and the setting is 17th century France in tunic. The game is built up around digitised pictures and contains six original music scores.

If you think that this all sounds a

## THE THREE MUSKETEERS



bit tame then maybe you'd rather have a go at *Blood 'n Guts* for the C64 (£9.95 tape and £14.95 disk). This is an ancient barbarian daction game which features such imaginative events as ale drinking, human biting and joust out throwing. Probably not recommended for the faint hearted.

### Footnote:

Cascade Games: Harrogate, N Yorks. Tel: 0423 523723. American Action and Computer Novels: Box 10980, N-200 43 Malmö, Sweden. Tel: (+46) 40 23 25 20.



## Sport Simulations

New from US Gold is a 3D pin bowling simulation entitled *10th Frame*. The game is by the authors of *Leadsboard* and aims to recreate the fun on 3D pin bowling for all the family.

Select league play and you can take the option of playing in teams of up to four people, or open bowling will allow up to eight individual players.

Features include scoreboard, pitman, automatic scoring, power and hook control, outstanding sound and pin action several different skill levels.

It's available for the C64 and will be released shortly on the Amiga.

On a totally different level,





### Cap:

Konami is releasing *WEC Le Mans 24*, a fast racing car simulation. Look out for more details.

#### Touchline:

US Gold: Unit 2/3, Hatford Way, Hatford, Birmingham B14 7AE. Tel: 0217 244 1268. Konami: Newcastle Road Buildings, Bond Street, Newton Abbot, Devon TQ12 2L.

### Pet Revival

Owners of PET computers have responded enthusiastically to the news that Supersoft is spearheading a revival of this once popular Commodore machine.



### Cap:

Supersoft bought up Commodore's last remaining stocks of the PET range in 1985. Since then enquiries from existing users have been flooding in.

However most of the stocks purchased were the older 4032 and 8032 computers and many users who enquired were hoping to expand their systems with the 8296 computer, the last produced in the PET range.

Supersoft has now managed to locate stocks of brand new 8296 computers in a Commodore warehouse in Europe. These have now been imported and are available from Supersoft at a price of £585 plus VAT.

### Hewson Future

Hot on the heels of the new year, Hewson is releasing a new C64 title. Named *Amazons*, it's due out at the end of March and is a multi-level game

combining strategy and basic shoot 'em up in order to appeal to all gamers.

The game is set in a labyrinth of rooms viewed from above. Intrigue and suspense is added since the rooms only become visible upon being entered.

You control Mervyn a sorcerer's apprentice who has evaded the evil warlocks by turning himself into a frog whilst trying to construct a body-building potion. You must combat 12 guarded wounds on each of eight levels to obtain master power and shields.

*Amazons* was written by Steve Turner, a regular Hewson programmer who has written several very popular games including *Dragonfire*, *Arkanoid*, *Amo*, *Clow* and more recently, *Quasmodam*.

#### Touchline:

Hewson: 5th Milton Trading Estate, Milton, Abingdon, Oxon OX14 4EL. Tel: 0235 812839.

### Welsh Winners

Konix, the company which produced the *Speed King* joystick, has been awarded the New Enterprise Award in the Welsh National Business Awards 1986.

The award was presented to the managing director of Konix, Wyn Hollaway (left of picture), by Sir John Harvey-Jones the chairman of ICI and was won just over 18 months after the company was formed.

Konix was the only company to reach three finals, the Design Technology Award, the New Enterprise Award and the Business Achievement of the year. Competing companies included Laura Ashley and British Airways.

#### Touchline:

Konix: Unit 15, Strydom Mill Industrial Estate, Penkridge, Staffs B23 4JZ. Tel: 069325 5931.



### Cap:



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# Sport on Channel 64

*Sport games have been an immensely popular area of software ever since the first crude ping pong. Here's a round up of the best simulations.*

*By Tony Hetherington*

If you're fed up with watching Liverpool playing every weekend, Steve Davis winning another match or yet another contest between Clara, Coc and Orvet then why not tune into Channel 64. We've got over 40 sporting challenges ranging from world football to America's cup sailing.

## Multiple Events

Activision released *Decathlon* in 1985 which was quickly followed by Ocean's *Osley Thompson's Decathlon*. The race to the Olympics was on. Both featured the 10 grueling events that form the Olympic Decathlon. *Decathlon* was the more accurate simulation as each competitor realistically juggled his prowess in all 10 events where as Ocean's game demanded success in one event before you could compete in the next.

Now joystick athletes can tackle the sprints and hurdles of *Summer Games* (seven events), high jump, equestrian and canoeing of *Summer Games II* (seventeen events), the superbobsled, ski jump, hot dog grill, skating and basketball of *Winter Games* (six excellent events), the sound the world tore of logging, rolling, barrel jumping, weight lifting and some wrestling of *World Games* (eight events) and the budget priced sprinting, archery and diving of *Go for Gold* (seven events). All of these are from US Gold.

## Soccer

Football fans had a field day last year with the World Cup in Mexico and we began five football games. The first was the literally basic conversion of the Spectrum hit *Football Manager* by Addictive Games that has been recently re-released. Unfortunately, C64 owners expected more of a game than their rubber-kayed cousins and it failed to score.

The best C64 football game is still Commodore's own *International Soccer*. Its simple gameplay let's you control the action against either human or nice computer oppo-

nents. The system is simple as you control the man that is nearest to the ball with the computer controlling all the "will the ball moving".

*World Cup Carnival* caused the greatest uproar from the crowd when it was released in time to capitalise on the World cup fever. Promising a badge, poster and a game that took six months to develop. However on release the game looked too familiar and turned out to be a slightly revamped version of Artic's *World Cup II*. This earned US Gold a yellow card and boosted sales of *New Games 2* that also carried Artic's game.

After the World Cup the papers were dominated by the incident when Diego Maradona punished the ball past Peter Shilton to knock England out of the cup. Now that moment has been immortalised in Commodore's (Argus) *Peter Shilton's Handball Maradona* game. However, the game itself is dull and uninspiring although it does contain the classic phrase "a game of two halves" in its instructions.

Argus's new *Footballer of the Year* shows more promise as you battle your way through poverty, low divisions and defences in your struggle to become the best footballer of the year. The game plays a computerised board game with goal attempts coming from bought goal cards and transfers, points won and business profits from chance "invalider" cards. Despite a few annoying bugs such as league goals being counted twice in your tally the game is relatively addictive.

## American Football

Football fans who enjoy the game American style can re-visit the 1985 Super Bowl when the Bears destroyed the patriots in Ocean's *Super Bowl* as well as play individual games in Bug Bytes budget *American Football*. Artic's *Artic's Touchdown Football* and *The Home Super Bowl Sunday*. You can also recreate the entire season in the gridiron version of Addictive's *Football Manager*, *Weekend*.





My pick of the bunch is *Super Bowl Sunday* that presents some complex accurate statistics in a highly playable form for a selection of football's greatest teams. Now you can be crunched by Chicago's 86 defence, throw touchdown passes with Dan Marino and the 82 Miami Dolphins and watch as John Riggins rips through defences to lead the Redskins to victory.

### Baseball

US Football's American brother baseball is also well represented as digital pitchers and hitters can argue over the strikes, balls, base hits and home runs in *Marshall's US Gold/Arcade's World Series Baseball* (Imagine) and *Activision's Star League Baseball*.

*Arcade's* debut game, *Baseball*, is the leader both in graphics and gameplay giving novice and expert a run for their money. Simple joystick moves select from the available sinkers, fastballs, curveballs, sliders and changeups that the hitter must bat over the fence for a home run. Nine innings of non-stop action.

### Golf

Golf has never been my favourite sport and has always prompted me to swap channels but Channel 64 has two budding betters: *Artisoft's* simulation, *Golf Course* and the "hit and see" action of *US Gold's (Arcade) Leader Board*.

The GCS golfer selects his clubs and then battles against his own handicap on one of four accurately simulated courses represented on screen both as a plan to choose your shot and a 3D view of the action.

There is nothing realistic about the *Leader Board* courses as they consist of a series of islands surrounded by ball clumping lakes. Both games are fun to play and better than the sport they represent. GCS is the more accurate game and suitable for a lengthy campaign to reduce your handicap from beginner (28) down to pro (0). *Leader Board* fans that share the game to the top of the charts can replay all their best shots as *US Gold* releases four more courses in its *Leader Board* Tournament expansion set.

There are other golf games such as *Mastertronic's* budget *Me in One* and the *Argus Addict* *Fiddle Fiddle* but the *Open* but *Leader Board* and *GCS* are the clear leaders.

### Cricket

Two famous names battled it out for the cricket honours as *Grain* *Grain's Two Cricketers* (Androgynic) took on *Yamaha's Jon Beckham*.

I found *Beckham's* to be the better game once you'd played yourself in but poor graphics let the appalling *Grain's* cricket take the honours. The graphics are quite impressive but soon lose their appeal as you realise they are just a series

of set patterns that interrupt the action. The game itself is dreadful and can be played in both arcade and simulation modes. The simulation mode is the game you can actually play and win while you're asleep! How well you do in the arcade version depends solely on the skill level. Choose the highest and you'll be all out in two overs but at the lowest you can score four and sixes off your bat, leg and nose!

### And the others...

For a change from the "popular" sports why not try wrestling in *Melbourne House's Road 'N' Brawl* that features 25 bone crushing moves in another game that out-glories it's sport. The same is also true of *Activision's Two on Two Baseball* that adds excitement to a dreary sport on *Scrap*. *Six and Spike* your way through a volleyball match courtesy of *Mastertronic* or punch your opponent into a pulp in *Punch Bros's Boxing* (Elite - now available as part of *Hipack's* *Barry McGuigan's World Championship Boxing* (Activision) and *US Gold's Fight Night* is the pick of the pugilists.

Whatever your sport you're sure to find a game to suit your favourite handicaps on yachting (*Over's Cup* - *US Gold*), table tennis (*Superstar Ping Pong* - *US Gold*) and *Joe Monkey* (Team Amos).

### Finalists

*Activision*: 23 Pond Street, London NW3 2PN. Tel: 01 433 1381.

*Arcade*: 6 Central Street, Manchester M2 3NS. Tel: 061 833 6633.

*US Gold*: Unit 2/3, Halford Way, Halford, Birmingham B6 7AH. Tel: 021 356 3388.

*Addictive Games*: 19 Albert Road, Bournemouth BH7 1BZ. Tel: 01202 266494.

*Commodore*: Hunters Road, Welton, Cusby, Northants NN17 1QE. Tel: 0338 263153.

*Argus*: *Grain*, 84, King's Way, Leicester Place, London WC2N 1AB. Tel: 01 439 0866.

*Grain*: *Alpha House*, 19 Carter Street, Sheffield S1 4PS. Tel: 01422 333333.

*Artisoft*: 68 Long Acre, London WC2E 9AN. Tel: 01 436 3471.

*Nexus*: 150B House, 50 High Street, Bournemouth, Bournemouth BH1 1AT. Tel: 01 438 3723.

*Androgynic*: 79 Saxtons Industrial Park, London Road, Reading RG1 6AE. Tel: 0734 664646.

*Yamaha*: *Addict* Industrial Estate, Bishops, Tye & Wye RG23 4TE. Tel: 081 414 4511.

*Melbourne House*: 60 High Street, Hampton Wick, Kingston-upon-Thames, Surrey KT1 4DB. Tel: 01 943 3811.

*Mastertronic*: 4-10 Paul Street, London EC2A 4AM. Tel: 01 477 6888.

*Elite*: 11 Roadford Street, Watford WD17 3AD. Tel: 0922 33802.

*Amos*: 15 West Hill, Darnford, Rom BA1 1L. Tel: 01222 82911.







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# USA Today

*There are a lot of strange peripherals available for C64s in the States. Here's a cross section just to whet your appetite.*

*By Lewis Tilley*

**D**o you have that tired, run down feeling? Does the big guy kick sand into your face at the beach? Do you want to compete better? Plug a *Bodylog* into your Commodore's cartridge slot and hook into the latest in sports training. This peripheral consists of the program plus a "standard EMG screen and lead set, head band and three electrodes" which you place against the part of the body you wish to monitor. The result reads out on your screen with the aid of the two software cart ridges included.

Computerized *Asclep Exercise and Trainer* or COMET is an electronic muscle builder which comes as an extra. A cardiac exercise and stress reduction package are also available. Prices run from \$149.95 for the basic package up to \$299.95 for the stress reduction gear. Mail orders to: Bodylog, Inc. (see Touchline for address).

There is an italicized sentence in the firm's advertisement which will be reading more often as the use of computers expand into the mass markets: "Knowledge of computers on computer programming is NOT necessary to use *Bodylog*." That, for you, fellow!

To continue your physical education course, don't forget the latest in footware. Puma's *R5 Computer Shoe* has a computer chip built into its heel. After each training run you connect up to your 64 for a readout of the run record. The time, distance and calories you used will be fed in for a comparison with your past data and future dreams. Only \$199.95 for a pair.

Now, let's see. We have the electrodes on your head, a computer chip on your foot, if you'll just stick your hand into this lightweight cotton glove its sensors will do everything a guy stick will do for you and more. It's

called *Hand Command* and comes from Shaw Data and costs \$40.

## Gone Fishing

Maybe you aren't a "jack", which is an Americanism for "idiot" coined from their supporters. Maybe you like to fish. Got just the thing for you. *The Computerized Fisherman's Fight Recorder* fits on to your pole to use its chip to remember how long and how hard you worked to catch that fish. Available from the US merchandise, Hammacher Schlemmer, for \$75.

## But seriously Folks

Heavy, heavy, heavy is this very different printer interface, *Driver* due from Progressive Peripherals and Software at a price of \$119.95. The price is high, but the features overwhelmed the reviewers of this new attachment. It contains 12K bytes, a 6801 8 bit micro-processor and its own power source. 16K of that memory is used as a print buffer but it doubles in bytes when it stores eight different fonts in that buffer as well. A utility disk comes with these fonts plus 22 varieties of the standard 8 x 8 font and an editor so that you can design your own. This graphics interface which links a Centronics printer to the serial bus of the Commodore deserves a thorough review of its abilities.

*Driver One* is a challenger to Super Graphics by NETEC which has offered its high technology to Commodore users for some time now. You might check it out from NETEC Inc. at 899-95. Their disk includes 27 fonts to be used with the interface.

If your major printout problem is impatience, you can get three versions of *Serial Box* which stores in a 64K buffer while printing to a Commodore Compatible printer. The *Serial Box-Plus* is serial to parallel with 64K

buffer, and the *Box-Max* is two parallel printers and gives a massive 256K buffer. All of these include a font design and utility program called *Font Factory*. They are GOS-compatible. R.J. Bushman Associates Inc. sell these at \$79.95, \$149.95 and \$299.95 respectively.

Kahak Labs, down in Puerto Rico, have devised an inexpensive way to scan a photo or drawing without the use of a TV camera. You attach a scanning head to your printer, or any typewriter, and connect to the 64's user port. The *Acocomputer* system takes cost to produce an image with its software which can be manipulated. The resolution is no better than might be expected, but it can be adjusted in total levels, exposure and contrast. Price for the complete kit is \$249.95 from Kahak Labs.

The best is yet to come. Berkeley Software, which revolutionized the new 64C, is working on an Apple LaserWriter driver for GEOS. The *LaserWriter* is a \$5000 printer which responds to a font language from Apple called *PostScript*. It prints typeset quality text. Here in the States, some shops are offering the services of print-printouts on their *LaserWriter* from your disk. [E]

## Touchline

**Bodylog (EMG)** 14 Maple Ave., Armonk, NY 10504.  
**Shardbite** 7121 Shady Oak Road, Eden Prairie, MN 55344.  
**MM Peripherals** PO Box 2672, Carson, CA 90718.  
**Progressive Peripherals** 464 Kalamath Street, Denver CO 80202.  
**NETEC INC** 2800 Arnold Road, Solon, KS 67401.  
**R.J. Bushman Associates** PO Box 1977, Hershey, PA 17033.  
**Kahak Labs** Adjuntas, PR 00601.  
**New Canine** PO Box 8042, Chicago, IL 60680.

# EREBUS

**£8.95**

COMMODORE 64/128

This smooth scrolling  
blast-'em-game features  
the very best in fast arcade  
action by Steve Lee (author of the  
Falcon Patrol series and Shogun) with  
stunning graphics by Martin Wheeler (famous  
for Spectrum Don Darc and the original designer of  
Sorcery). It is a multi-sectioned game with many varieties  
of tough aliens to eliminate. You must fight through each wave in  
your highly manoeuvrable spherical space fighter and save Earth from  
the horrible fate of the noxious nerve gas being produced on planet Erebus.

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PLEASE DO NOT POST CASH.



# I.Q.

*In this new regular feature we bring you the best of strategy and adventure games together with some useful hints on how to improve your play.*

## The Pawn

Originally written for the Atari ST, *The Pawn* had rare reviews both for its graphics and for its complex parser.

Rambrod is the apocryphal son of British Telecom's software wizards and as with *The Jewels of Darkness*, this program is available at £19.95. But considering that you get two disks, plenty of supporting written matter and an A3 sized poster, it is not bad value.

Instructions to play the game come in two small booklets, one Commodore specific and the other a general gameplay guide. There is also a very well produced 55 page book containing the background story and several pages of mythologised hints for the difficult bits.

The first option, that is highly recommended, is to make copies of two Pawn disks, henceforward to use these copies and retain the originals safely stored away. There is even a copy program included so that you need no additional utilities to achieve this.

This story is a strange mixture of ancient and modern, with old favourites such as dwarves, a missing princess, and all powerful magicians and an ice castle with no doors. What this land of Kerrosia also has, are many oblique references to a more modernistic society that tends to replace the classic framework with a satirical identity which is both amusing and witty.

The final aim of the game is not spelled out, but with an unpopular king, a general election in the offing, some murky trading in the drink market and groups of banished dwarves in the wings not to mention Kerros the Magician—anything is possible.

In common with these superb adventures from Infocom, this program makes a great deal of use of the disk drive. This regular disk access at most keyboard entries does mean that each move takes time to reach some form of conclusion, especially when large pictures are to be created.

The graphics are excellent but the full picture only allows three lines of text beneath it—so even more time is lost as you try to assimilate a number of lines of text, three at a time.

The instructions acknowledge this problem and recommend using another graphics mode, with only occasional peeks at the large pictures! One thing is certain, *The Pawn* offers a great variety of viewing and editing controls that should satisfy the most demanding player.

It is possible to get into quite a muddle with all the picture controls, whereby you are looking at a picture that is not that of your present location. GRAPHICS NORMAL



Laboratory. There are many intricate sound and lightning, flames and touch with a dramatic colored light.

puts everything right and you may then start your choice of graphics mode all over again.

*The Pawn* gives you a number of editing controls, a most useful one being the facility for calling back your last command for re-editing. Communicating with the game is fairly easy, as the parser recognises many different ways of saying the same thing. Leaving the Game's bar may be accomplished by any of the following: LEAVE HUT, GO EAST, E, GO E, OUT, O, EXIT, EXIT HUT or EXIT EAST.

These are very simple commands but an example given in the instructions shows that the parser will also accept such a verbose command as GET ALL EXCEPT THE CASES BUT NOT THE VIOLIN CASE THEN KILL THE MAN EATING SHREW WITH THE CONTENTS OF THE VIOLIN CASE! The parser will also understand when an object already specified, is to be used again: GET SHIRT THEN TIE IT TO RARE.

Although this all sounds wonderful and indeed makes life that much easier in most cases, do not assume that the command interpreter is all powerful. You must still retain the true adventurer's cynical attitude and double check your surroundings.

An example of this may be found when you first arrive in Kerrosia. You are wearing jeans and a T-shirt and have a mysterious silver band stuck around your wrist. Obviously you immediately run an inventory check, this tells you nothing more. You know the program is intended for its

parade as my **FEEL IN POCKETS** - great, the answer is "The pocket is soft". However it takes three more commands to ascertain what is in there.

If you get stuck, there are a number of hints given to help you. These are in the form of a series of two character blocks: **AN VS SB DO GO SB**. Type in **HINT** and you will then be asked to type in the code. There are usually three sets of code for each potential question, the first often gets a flippant response, the third is usually quite useful.

There will be several times where you have to talk to characters you meet along the way. The parser again offers you a choice of how to go about this. There is a useful command **LISTS** that will list all possible directions of movement from your present location. **AGAIN** repeats the previous command and **SCORE** gives you your current score and the maximum possible score.

With all these facilities to be shovelled off, what is the adventure itself like? There are lots of laughs, plenty of traps to check out and a reasonable difficulty level. Draw maps carefully as movement from one location to another is not always quite as you would expect it to be. **SAVE** your game position regularly (you'll need a previously formatted blank disk).

Altogether an interesting experience with a true adventure dressed up in the most modern mixture of programming technique and offbeat humour. We will have to wait and see if these higher priced super-products can stand the competition from cheaper and less elegantly programmed adventures. For Magnetic Scrolls, *The Parser's* programmers, I hope so - I'm looking forward to seeing their next offering. **P.F.**

## Question

Those of you who enjoy the *Ebenezer* series of adventures may well find that *US Gold* have come up with another winner in the same mould. *Question* is a fantasy adventure game written by Strategic Simulations Inc in the USA. It is disk only but this is no disadvantage - so there is plenty of program there to be explored.

The land of *Question* has had a distinctly turbulent past. Everything fell apart as the nations some hundreds of years ago when one of the King's two chief wizards finally took the left hand path and became completely evil.

From that moment on, a greater and greater number of evil monsters invaded the countryside. The population began to seek shelter in underground towns, as there were the only places they could be sure of defending. Many were the knights that went out in the hope of defeating the evil Master, but none returned.

The countryside and towns are shown in plan view and depicted in 3D. The symbols representing plains, jungle, mountains and swamps also look familiar.

This plan view takes up about two thirds of the display, with a number of action options to its left together with a brief status of the character's vital statistics. Reports of what is happening and your input commands appear out of four lines at the bottom of the screen.

Control may be entirely from the keyboard or a mixture of joystick and keyboard. All keyboard action commands are single key presses, so the action is quick and simple to master. Whilst roving around you have such commands as: **Arm** (change of weapon), **Dismiss**, **Fight**, **Hold Item** (for

use by Opponent), **Speak**, **Wear**, **Rob**, **Unlock**, **Take** and **Examine**.

As you move your character, the screen scrolls past, disclosing further areas of the country. There are a number of towns to visit and in each you will find shops that sell different means of transport ranging from horses and lamas to rafts, clippons and eagles.

The towns also have two other places of great importance, **Jails** and **Casinos**. Bribe the warden and he will let you talk to one of the prisoners.

The *Casinos* offer three types of gambling 'double or nothing', 'blackjack' and 'roulette'. A cool head and careful strategy can make you a rich man fairly quickly. *Gold* is an important part of the game and the two main sources are by killing monsters and by gambling.

*Gold* has to be bought at regular intervals and as you progress, you may also find a use for superior weapons and equipment. In many in the *Casinos* of winning too much, too soon. Win over 2000 gold pieces, the gambling is closed and the town guards will attack you. They are fairly tough and if you have not yet built up your hit points, you may come to an early end.

There are several Cathedrahs to visit. These contain *enigmasque* magicians from the past and they are able to help you in many ways.

You start out with 12 points of your five main attributes: strength, stamina, dexterity, intelligence and charisma. These attributes may be modified as play proceeds and you become wiser to the ways of *Question*.

There is one other main aim for you to find on the mainland and that is the King's Castle. Here you will find the wizard *Melcor*, almost equal in power to the evil Master. Talk to him and he may well help you on your way.

Eventually you will want to talk to others in the castle but as they are behind locked doors, this is no easy task. First you will have to steal the right keys and this will bring any nearby guards hotfoot for the kill. You will have to have found a means of replacing your certain loss of hit points.

Once you have reached a high enough position in the land, you will be requested to seek out and destroy Master in his land of evil across the sea. Now you will have to find a way through those areas of thick choking fog that have so far ended your exploration.

This evil land far to the west, has even today, got a few trading posts. Here you can buy various magical items and



several weapons that may be useful against the many new varieties of monsters found above and below ground. The Dungeons are rife with traps and all manner of nasty things, fortunately there are a fair number of treasure chests and magical customs. You may even be lucky and find a compass.

For all those physical types that delight in roaming off into the great blue yonder, polish your boots and oil that sword, Quest run needs a hero. Just remember, gub-as much gold as you can, never talk to the guards and leave pinching the King's gold until you are sure of yourself. P.F.

## Moonmist

You receive a letter from one of your old friends Tamara Lynd in which she can't wait to tell you her news. She has become engaged to an English Lord no less and is going to live in Trephian Castle out in Cornwall—a lovely old place and reputedly haunted.

How things change! Eight days later, a second letter arrives and the tone of happiness has been replaced by one of sheer terror. Tamara is convinced that someone is trying to kill her. There have been two attempts on her life so far. Also, several of the guests at the castle have reported seeing the White Lady, especially after the unfortunate drowning of one of Lord Jack Trephian's former girlfriends. As you have a reputation as something of an amateur sleuth, she begs you to come over and see if you can clear things up.

So the story is set for *Moonmist*, the latest detective story from these masters of the adventure game *2 Infocom* (distributed in the UK by Activision). The game is set at introductory level and is ideal for those of you who don't quite fancy yourselves as Sherlock Holmes just yet. At the beginning, you are prompted for your name and title, thus determining your sex. All the responses within the game are then adapted around your answer. You are also prompted for your favourite colour for there are no less than four different variations within the game so that it is not something that you just play once and forget about.

The game starts with you driving up outside the castle gates. You quickly meet some of the other guests before going to your room to dress for dinner. No sooner have you taken a couple of bites than the plot thickens when a secret tape recorder plays a message from Lord Jack's late, eccentric uncle in which he states that there is treasure

hidden somewhere within the castle and grounds.

Treasure, a ghost with some very odd behavioural habits, the death threat to Tamara and the mystery of Dorian's drowning when no body was ever discovered should keep even the most brilliant detective quiet for a bit. You will have to go round the castle, searching for clues and secret passages and asking the guests what they know about various people or objects.

For once, the atmosphere created within the game is not up to the usual Infocom standards. The main reason for this is that the Americans have no idea how the British upper classes behave save what they have seen in the pictures. A Coldstream Guards officer sounds more like Elias Doolittle's father in *My Fair Lady* whilst the butler does a very good impression of Bertie Wooster rather than Jeeves. These idiosyncrasies aside, the rest of the game is well up to standard with rooms of excellent text descriptions and (thank goodness) no graphics.

Infocom is also famous for the way in which the games are packaged and *Moonmist* is no exception. A book on the ghosts of Cornwall, a tourist brochure to the castle, Tamara's two letters and an iron on transfer for a tee-shirt are all included. If you have always fancied yourself solving a major crime, or fear in this case, you could do a lot worse than discover why Moonmist has helped to make Infocom the best adventure writers in the business by a long way. G.R.H.

## Silicon Dreams

For some reason or other, most adventure plots have been more concerned with orcs and wizards rather than spacemen and lasers. For the discerning sci-fi buff, there has been a distinct lack of decent games. Now, their wait is over for Rainbow has put together three of Level 9's old games into one large compilation.

*Silicon Dreams* is the title and the games included are *Snowball*, *Return to Eden* and *The Worm in Paradise*. The games have been re-written and expanded to make use of Level 9's latest parser and compression techniques. In the case of *Snowball*, graphics have been included for the first time.

You play the part of Kim Kimberley, secret agent extraordinaire. In *Snowball*, you are charged with protecting an interstellar from your hibernation, you are aware that something is dreadfully wrong but have no idea what. sinister nightingales lurk and pursue you as attempt to make your way to the control room and stop Snowball 9 from crashing into the planet Eden. The fate of a mere two million people lies in your hands.

Although you managed to save the ship, it was sabotaged and several powerful people have put two and two together and made five when they found you guilty of sabotage. Sentenced to death, you managed to escape and became the first of your race to land on Eden. You must reach the robot city of Enoch and stop them from destroying Snowball 9. As if that wasn't enough, the crew of *Snowball* are still after your blood.

In *Worm in Paradise*, the setting is the city of Enoch 100 years later. The organisation of the city is somewhat strange being based on zero taxes, instant fines for crime and a booming business in spare parts for transplant surgery—you are immortal if you can keep replacing the necessary bits.







You start off trying to make money but there is something definitely wrong. Can you, a mere citizen manage to save the world?

The games allow complex sentences to be input and the same supports such features as 'get all' and the use of 'B' as in 'get hot and open it'. You can save the game to tape as did as well as make temporarily to RAd. Another useful command is 'COOP' which allows you to correct those irritating little mistakes that just happened to kill you by stepping back a move. The games come complete with full instructions and a 42 page novella entitled 'Etern Rose'.

Even if you already own one of the adventures, you should still seriously consider this package in its updated form. If you haven't got any of the games, then *Shadows Over Innsmouth* has got to be one of the bargains of the year at \$14.95. G.R.J.

### Next Steps

If you've ever fancied yourself as a tank commander, here's your chance to prove that you really are a latter day Roman. Not only do you get to control a tank, but a whole armored battalion.

The setting for this latest wargame from the US GoldSSI stable is a land battle at some stage in the near future. You can choose to play American, Russian and, unusually, Chinese forces over a set of variations that is absolutely mind-blowing. If the problems of controlling an entire battalion was not hard enough in the first place, the whole game takes place in real time so there is no sitting back during a case of coffee and monitoring over your meaty mouse.

There are two basic scenarios. War is just there to let you get used to the controls. Pursuit and exploitation is an intense threat to enemy territory. Meeting engagement in a chance encounter. Attack sees you trying to break through the enemy lines as you try to reach a key objective and defiance is the exact opposite. You can choose which side you want to be, which of all different scenarios you wish to fight over and whether or not you want to alter the relative strengths of the two sides.

Control of your units is very straightforward. One letter designates the unit and a second to issue the order. There is also a moving cursor to designate the area you wish to shoot at or move to etc. You can command include moving, firing normally, providing suppressive fire or breaking a tank's screen. Enemy units only appear on the map when they have actually been discovered.

Apart from your tanks, you may also find yourself in control of supply trains, anti-tank units, scouts, heavy mortars and engineers.

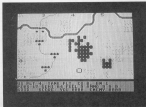
The game looks deceptively easy. Starting at novice level, nothing happened for a few moves until I found the enemy and destroyed it without taking any damages. As soon as I started playing for real, everything was on a much grander scale and I got wiped out without any apparent effort on behalf of the enemy, most of whom I never even saw. Coming complete with an excellent 20 page instruction booklet, Battalion Commander is one of the best wargames out produced for the C64.

G.R.H.

**Forthright:**  
118 Gold-Unity 2/3, Halford Way, Halford, Birmingham B15  
Fax: Tel 0121 356 3188.

**Hamblin:** First Floor, 74 New Oxford Street, London WC1A  
1PS. Fax 01 240 8838.

**Archibald:** 25 Pond Street, Hampstead, London NW3 2PN  
Tel: 01 431 1181.



### THE ULTIMATE BACKUP CARTRIDGE IS HERE

**ACTION...**



**NEW IMPROVED VERSION**

**FAST! LARGER! IMPROVED!**  
(See Examples in Store)

You're at the risk of a scratch you have a fast load cartridge that will speed up your normal disk load speed by 5-6 times.

Special switching hardware makes the fastest available to the system — Uses no memory.

**100% SUCCESS ?**

**OWN THE LATEST PERFECTED PROGRAMS!**

Action Replay is under constant development to stay on top of latest releases. For the product will save within 100% success on latest.

Replay... supports all programs that will load on any system. It will load any program that will not be loaded on any.

Action Replay is designed to protect your data backup the fast and safe — Action Replay's unique design.

FOR 64128 ONLY £24.99 POST FREE

- Stop the action of your game and make a complete backup to Tape or Disk.
- Action replay works by taking a "snapshot" of the program in memory so it doesn't matter how the game was loaded — at normal or high speed — from Tape or Disk.

**Just look at the features, no other unit can offer such value.**

- ☐ TAPE TO TAPE ☐ TAPE TO DISK ☐ DISK TO DISK
- ☐ DISK TO TAPE ☐ ALL BACKUPS WILL RELOAD AT TURBO SPEED AND RUN INDEPENDENTLY OF THE CARTRIDGE.
- ☐ SPECIAL COMPACTING TECHNIQUES TO SAVE ON DISK SPACE.

**UNIQUE CODE INSPECTOR FEATURE**

- Say the words with the letters that appear any one of memory in the "Trace" data including all PC - 100 KHz/1000 Hz.

- **SO SIMPLE TO USE:** Just load your game as normal. When it progresses to the point at which you want to save it, simply press the button that:
  - Press 'D' to save to disk to reload at high speed.
  - Press 'T' to save to tape to reload at high speed.
  - Press 'E' to save to disk to reload at normal speed.

THE PROCESS IS FULLY AUTOMATIC — JUST USE THE BACKUP A NAME

**EVEN MULTI-STAGE PROGRAMS**

- ☐ How programs that load extra sections can be transferred from tape to disk.
- ☐ Works with most programs files - Standard System.

**HIDES SCREEN DUMP**

- ☐ Key lines screen from your favourite games can be saved to disk.
- ☐ Compatible with many graphics packages including Sliding Windows, Maps etc.

Action Replay II is designed and produced by Date Electronics. It is the original name in Commodore action.

**ACTION REPLAY ENHANCEMENT DISK**

Action Replay II's capabilities were further enhanced by a collection of new features. It is now possible to save a complete game to a cartridge. It is now possible to save a complete game to a cartridge. It is now possible to save a complete game to a cartridge.

**GRAPHICS SLIDESHOW SOFTWARE**

Graphics Slideshow software allows users to create slideshows of their favorite games. It is now possible to create slideshows of their favorite games. It is now possible to create slideshows of their favorite games.

SPECIAL ENHANCED MINT DISK AND SLIDESHOW TOGETHER ONLY £11.99

## Disk Mate II

DISK UTILITY CARTRIDGE

only £14.99 POST FREE

If you have a disk drive then you need a DiskMate!

- ☐ DiskMate is a fast disk buffer that will speed up your normal disk load by 5 times.

**BETTER THAN ALL**

- ☐ Fast load
- ☐ Fast format (up to 10 seconds)
- ☐ Improved single mode 100 commands in fast mode, directory search etc.

- ☐ Enhanced function keys in fast, normal, fast, directory, normal etc.
- ☐ 100% faster mode commands in fast, normal, fast, directory, normal etc.

**PLEASE!** powerful machine mode commands (disks) are the most popular commands available. DiskMate, mode fast, normal, fast, directory, normal etc. 100. This is a full machine, not a disk drive or tape cartridge.

- DiskMate's unique special switching technology which makes it "transfer" to the system. Therefore the hardware will work with more software than other types. It allows the system the other commands available in the popular mode commands, for example the "mode" mode and it also in fast mode 100% and fast mode 100%.

**SPECIAL OFFERS**

- Buy Action Replay II and DiskMate II together for only £34.99
- Buy Action Replay II and DiskMate II together for only £39.99
- Buy Action Replay II and DiskMate II together for only £49.99

IT'S HERE! AMERICA'S BEST SELLING DISK BACKUP SYSTEM NOW AVAILABLE IN THE UK!

## FAST HACK'EM

FOR THE COMMODORE 64128

A-BULKY-MODULE SYSTEM - ALL ON ONE DISK

FAST HACK'EM IS THE SIMPLEST THE BEST COPY SYSTEM AVAILABLE. ANYWHERE AT ANY PRICE.

**WHY BUY MODULES?**

• Buy a module that is designed to be used in a single system. It is designed to be used in a single system. It is designed to be used in a single system.

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**WHY BUY FAST HACK'EM MODULES?**

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# Hack Pack 128

*An excellent extension package for the C128*

*By Stuart Cooke*

When the C128 was launched, its improved version of Commodore Basic was widely acclaimed. It was now possible to produce sound and graphics with far greater ease than with the outdated Basic of the C128's little brother the C64.

A plethora of Basic extensions are available for the C64 to make it easier to use, even. Your Commodore has published some in the past. However, with the new powerful Basic of the C128 you would think that it would be unnecessary for anyone to produce an extension package for the C128. Systems Software obviously think differently as they have produced an excellent extension for the C128 called *Hack Pack*.

*Hack Pack* can be split into three distinct sections and it is up to you which ones you actually LOAD and use. Available for use are a Basic/programming toolkit, a RAM-Disk and a program compressor.

## The RAM-Disk

This is probably the strong point of the package and a must for anyone who requires instant access to small programs.

The C128 has, as its name suggests, a large amount of memory. In most applications not all of this memory is required by the user and is wasted. The RAM-Disk option of *Hack-Pack* allows you to set up this area of memory as a disk-drive, of course it has no moving parts but it is possible

to SAVE programs in this area, you can get directions of files that are stored in there and most of the normal disk commands work.

If you are using Basic the RAM-Disk is allocated two blocks of memory at the top of banks zero and one. This does mean that the amount of memory that is used for Basic is reduced but this doesn't affect your programs that much since you would be very unlikely to have a Basic program that takes up all of the available memory.

Should the RAM-Disk clash with your own programs then commands do exist that allow you to locate it

wherever you want in memory. I wouldn't expect a novice programmer to understand how to go about this but should you feel competent the manual is very clear and you should have no problems.

As you are no doubt aware the Commodore disk drive is set up as device number eight. To avoid a clash with this the RAM disk is accessed as device number nine, again this can be changed by the user.

So what is the advantage of using a RAM-DISK? Firstly there is the advantage of speed. A program can be SAVED and LOADED into and from a RAM-Disk almost instantly. This has the advantage that if there are a number of programs that you are going to require a lot you can imagine one that you are using very easily.

The COPY command has been extended to allow you to copy between the RAM disk and a normal disk drive. It is possible to COPY single files between both the normal and RAM disk however the most useful feature is the ability to make copies of all the files on the RAM disk on a normal disk with one simple command.

## Toolkit

As I have already stated it is difficult to think what commands are missing from the C128's Basic. System Software has however managed to select some extremely powerful and useful commands for this extension.

Should you want to make change

```

10 REM *****
20 REM * THIS IS A DEMO PROGRAM *
21 REM *****
22 FOR X = 1 TO 1000
23 PRINT "THIS IS A DEMO PROGRAM"
24 NEXT X
25 PRINT "NEXT 1"
26 PRINT "NEXT 2"
27 PRINT "NEXT 3"
28 FOR Y = 1 TO 1000 STEP 1
29 PRINT Y
30 NEXT Y
31 PRINT "NEXT 4"
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```

within a Basic program then it is actually quite difficult to find the area of the program that you wish to make changes in. Wordprocessors get around this with a SEARCH and REPLACE command which allows you to search through a document for the occurrence of any word and turn it into another one. Mark Pack's has a FIND command which will allow you to search through a file for a specific word. There is even an option that allows you to specify which section of the program is actually searched.

An extension of the FIND command CHANGE, allows you to search a program for a specific word and change it into another.

DUMP will print a list of all variables, functions and arrays that have been set up to be printed-out. This is extremely handy when debugging a program since it allows you to see at a glance the state of all variables.

INFO will give you some interesting data about the status of the computer. Printed-out after an INFO command are:

Number of bytes occupied by Basic.  
The number of bytes occupied by variables.

Number of bytes occupied by arrays.  
Number of bytes occupied by strings.  
The number of bytes available for Basic text.

The number of bytes available for variables, arrays and strings.

MERGE will allow you to MERGE two files together in memory. This is extremely useful if you have a number of subroutines stored on disk since you can add them to your latest masterpiece with this command.

TYPE will take an ASCII file from disk and print it on the screen. SIZE will display the size of the specified file in bytes and can be used with any type of file and the QUIT command will deactivate the toolkit.

### Compressor

When you are writing a program in Basic it is useful to spare the program out as much as possible with a small number of statements on each line. To

make it even clearer you may even REM the program to make debugging easier. A more efficient and memory saving method of program writing is to place numerous statements on one line. What a compressor does is take a specified file, remove all unnecessary spaces and all REM statements then it reduces the number of lines in the program by placing as many statements on each line as possible.

Figure 1 shows a program before it has been passed through the compressor and after it has been compressed.

Mark Pack is an extremely useful addition to the collection of a serious C128 owner. Even in the short time that I have had it for review I have found it indispensable and use it regularly, the RAM-Disk being exceptionally useful.

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*software getting harder.....*



# Gauntlet

*The most popular arcade game in the last 12 months has been brought to the small screen. Enter a world of heroes, magic and lurking danger.*

*By Mark Curry*

**G**auntlet is a two player arcade game which is totally addictive, as many of you will know from the hours you've spent shooting your hard-earned pennies into arcade machines.

Now it's been released for the C84 by US Gold and is set to be a number one.

It's a one or two player game, but take my advice and stick to the two-player option. There are two reasons for this, the first is that you'll get much further with it and the second is that it's a great deal more fun. You can decide to help or hinder each other (you play simultaneously) but watch out for treachery if you're supposed to be co-operating. If you're both low on health points then there could a mad dash for the nearest succulent turkey to pop you up and the loser may dwindle away to a pile of bones!

When you start you are given a choice of four characters. You can choose to be either Thor the Warrior, Thera the Valkyrie, Merlin the Wizard or Quester the Elf. Each has different attributes and strong weak points. For instance, Thor's got great armour and is very good at hand to hand combat, however he's pretty poor on the magic front. Merlin, on the other hand, has no magic, can't fight very well with his bare hands but good at trapping people.

Once you've decided which person you want, then you can go straight into the game. Monsters abound, Ghost, Goblins, Demons, Lobbers, Sorcerers and Death. Each have different ways of draining your energy and they all come in droves except Death, although numbers of these increase on the higher levels.

When you first play the game you may be quite daunted by the numbers of villains which you are expected to destroy in order to work your way around the mazes. The best way to get around this problem is to head for the generators. These are little square blocks which look different depending on which kind of monster they are charming out. Shoot these and the number of monsters can be controlled. Get rid of all of them and you can safely walk around a section to explore.

In and around the dungeons are objects to pick up to increase your chances of success. Potions are very useful as they are the only thing which can kill Death (which sounds like a contradiction in terms but isn't in this context). Special Potions give the player special abilities. You can also grab extra armour, magic power, shot speed, shot power, light power and pick up power which are pretty self explanatory.

Food is probably the most important thing to collect as this keeps you going. There are joints of meat lying around and bottles of cider. Be careful not to shoot the cider, before you can get to it. Poisoned cider looks slightly different so

watch out for it since it decreases your health points. There are keys to open doors and loads of treasure to pick up. An amulet will make you invisible for a while. Traps are glowing patterns on the floor which remove some walls and transporters take you from one area of the maze to another. Keys are labelled black squares which move you to another level. It will not necessarily be the next one, you can skip around quite a lot which means that the game has little chance of getting boring as there are hundreds of levels. There are also Immense Rooms which you stumble on at random. These are bonus screens with no villains but there is a time limit. You must collect as much treasure as possible and find the exit. The limit is usually 10 seconds.



The whole game is impossible to map, there are just too many mazes and it wouldn't help very much anyway. All the dungeons are very different in layout and some of them are extremely complicated. Some have only one exit, others have several.

There are many different ways to play the game. You can go for a high-score, you can try and get to the very high levels, you can work alone or in partnership, all have their own advantages and all are fun. It's a fascinating game and well worth every penny.

#### Feedback

Title: Gauntlet. Supplier: US Gold. Units: 2/5 Modified Play. Platform: Amstrad/CPC 464. Tel: 01 235 1500. Modified C84. Price: £29.95 tape, £34.95 disk. Originality: 6/10. Graphics: 7/10. Playability: 10/10. Value: 10/10.



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Welcome

# Merlin Assembler

*Assemblers aren't very common for the C16 and plus/4.  
However we've managed to have a look at this one from  
Wizard Software.*

*By Paul Eves*

**M**erlin Assembler is a full 7501, two pass assembler for the Plus/4 and C16. It comes both on Tape and Disk. Wizard have gone for a green screen display once the assembler is activated. This is for 'eye comfort'.

The program assumes that the user has a knowledge of 6502 machine code, so if you are not familiar, I would suggest you acquire some before attempting to use this package. Because Merlin resides at \$1000 to \$21000, Basic has been moved to \$2100. Once you have a source listing ready to assemble, you just type ASM and press return.

Once loaded, Merlin leaves the Basic intact. Therefore you may still use the already familiar editing features of Basic. Basic may also be integrated in the source listing. However, all Basic lines must be after the END statement, and are activated by GOTO and run RUN.

## Program Designing

When designing a program using Merlin, the first and rather must be the COM command. This command tells the assembler where to start assembling in memory from. If this command is missing, then your program will not be assembled e.g.

```
10 COM $5000
20 LDA # 5FF
30 END
```

This would begin assembly from \$5000 onwards. In other words the instruction like # 50 would be the first instruction at \$5000.

As COM is the first instruction of any assembly program, END must be

the last. If END is missing the assembler will not know when to stop assembling. In this event, should you have a Basic program for your source code, the assembler will flag every unrecognised line as a syntax error.

The LIST command allows you to see what has just been stored into memory. If you do not wish to see everything, you may insert a STOP command e.g.

```
10 COM $5000
20 LIST
30 LDA # 5FF
40 STOP
50 LDA # 520
60 STA $E05
70 END
```

The above program would produce the following display on the screen after the copyright notice:

```
5000 AD FF LDA # 5FF
READY
```

Note that lines 50, 60 and 70 have not been listed, this is because of the STOP command. If you wish to LIST the whole program then leave the STOP instruction out.

## Labels

The use of labels in assembly language programming is essential. Notice I said Assembly Language programming and not Machine Language programming. Nobody in their right minds would attempt Machine Language programming these days, unless they were from the old days of large complex machines.

Labels can be used anywhere within your source code, but must be after the first COM command. All

labels must be preceded by a full stop, e.g. LOOP and GOT are valid labels, but LOOP and GOT are not. The use of labels makes the task of the programmer that much more enjoyable. Consider the following small program.

```
10 COM $5000
20 LDA # 5FF
30 JNE DELAY
40 LDA # 501
50 LDX # 500
    ; rest of program here
200 DELAY DECX
220 BNE DELAY
230 RTS
240 END
```

Instead of having to calculate forward to backward addresses, you just put in your labels and the machine does the hard work for you. Labels also make for better program design in my opinion.

Two instructions that are pretty useful are \*TX and \*DA. These allow for the storage of data as either ASCII values or NUMBER values e.g. ,

```
*TX "YOUR COMMODORE IS TEXT"
*TX "50 IS THIS"
```

This would store the above two sentences in memory under their ASCII codes.

```
*DA $50,$FF,$55,$00,$FF,$2066
```

This would store the numerical values into memory. Note the mixture of both hex and decimal numbers. As is standard, the '\$' is put in front of any number that you wish to be taken as hex.

## Comments

Another important feature of assembly programming is to somehow put comments within the program. This is so that both the programmer and anyone reading the listing can see what's going on. This is far more important in assembly programming than in Basic programming. The way we achieve this with *Mosde* is by the use of remarks. A `"` denotes a remark. A remark can be left in the source listing on a line by itself. Alternatively, you can put a remark at least one space after the instruction with either `"` or without it, e.g.

```
10 LDA # 500 ;Zeroes the X reg
20 ;Back to indexing a list
30 LDA # 500 ;Zeroes the Y reg
```

All the above are valid remarks.

On assembling, any errors found are reported back to the user on screen. The format being LINE:NUMBER THEN THE ERROR. For example:

20 LDA # 500

would produce the error

LINE:20SYNTAX ERROR.

Obviously there is no instruction LDA.

Although this program is not as powerful as the Assembler I am used to (H594 and PAL, to name but two), I found it easy and quick to execute. Beginners to Assembly programming will find *Mosde* a very good aid to the development of their programs.

## Extra

There are two extra points where I think this particular assembler scores over most others, that is the assembly has some intelligence of its own. To make this more understandable, look at the following short program.

```
10 LDA # 500
20 LDY # $D000
30 LDA (DXCLX)
40 LDA (DXC,Y)
```

Line 10 is legal and valid. Line 20 is not valid, however the assembler would assume that you meant LDY.

Still, in other words it ignores the H1 order byte and loads the accumulator with the LOW order byte. Lines 30 and 40 are both common errors that you will make. (Index register addressing always manages to confuse people). On encountering these types of errors, the assembler would assume that you meant 30 LDA (DXC),Y and 40 LDA (DXC,X) respectively. This feature of the assembler is, in my opinion, its greatest asset.

I have to be totally honest, and say that as my knowledge of the Plus/4 and C16 is somewhat restricted, I could not give this package the kind of in-depth trial that I would prefer. However, from what I have seen of it so far I have no hesitation in saying that it is a good buy.

## Teacher

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disk 70	11.00	22.00	44.00	88.00
disk 80	11.00	22.00	44.00	88.00
disk 90	11.00	22.00	44.00	88.00
disk 100	11.00	22.00	44.00	88.00
disk 110	11.00	22.00	44.00	88.00
disk 120	11.00	22.00	44.00	88.00
disk 130	11.00	22.00	44.00	88.00
disk 140	11.00	22.00	44.00	88.00
disk 150	11.00	22.00	44.00	88.00
disk 160	11.00	22.00	44.00	88.00
disk 170	11.00	22.00	44.00	88.00
disk 180	11.00	22.00	44.00	88.00
disk 190	11.00	22.00	44.00	88.00
disk 200	11.00	22.00	44.00	88.00
disk 210	11.00	22.00	44.00	88.00
disk 220	11.00	22.00	44.00	88.00
disk 230	11.00	22.00	44.00	88.00
disk 240	11.00	22.00	44.00	88.00
disk 250	11.00	22.00	44.00	88.00
disk 260	11.00	22.00	44.00	88.00
disk 270	11.00	22.00	44.00	88.00
disk 280	11.00	22.00	44.00	88.00
disk 290	11.00	22.00	44.00	88.00
disk 300	11.00	22.00	44.00	88.00
disk 310	11.00	22.00	44.00	88.00
disk 320	11.00	22.00	44.00	88.00
disk 330	11.00	22.00	44.00	88.00
disk 340	11.00	22.00	44.00	88.00
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disk 360	11.00	22.00	44.00	88.00
disk 370	11.00	22.00	44.00	88.00
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disk 410	11.00	22.00	44.00	88.00
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disk 680	11.00	22.00	44.00	88.00
disk 690	11.00	22.00	44.00	88.00
disk 700	11.00	22.00	44.00	88.00
disk 710	11.00	22.00	44.00	88.00
disk 720	11.00	22.00	44.00	88.00
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disk 750	11.00	22.00	44.00	88.00
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disk 1980	11.00	22.00	44.00	88.00
disk 1990	11.00	22.00	44.00	88.00
disk 2000	11.00	22.00	44.00	88.00
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disk 2110	11.00	22.00	44.00	88.00
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# Games Reviews

*As always there is a wide variety of games currently available. We've picked out a selection for you to peruse.*

## EREBUS

I know you're not going to believe this. Earth is in danger again and you've got to save it!

Erebus is a distant planet used by man to reprocess dangerous waste. Even some unpleasant aliens have reprogrammed it to produce a killer nerve gas to wipe out mankind. Naturally you, alone, are sent to obliterate these Hachans and save the world.

The refinery is split into circular levels that you must visit, rapping aliens as you go, until a dimension door opens letting you through to the next level.

Each level consists of raised barriers and objects designed for you to crash into while being chased by mischievous aliens.

In between levels a bonus screen helps you to practice your shooting skills but it doesn't save the game from becoming yet another Urduum inspired shoot-em-up. T.H.

### Touchline

**Title:** *Touchline*. **Supplier:** Virgin. **3rd Version:** *Ford, Porsche, Alfa Romeo*. **London W11 2SE.** **Tel:** 01 727 8070. **Machine:** C64. **Price:** £3.95.

**Originality:** 4/10. **Graphics:** 6/10. **Playability:** 5/10. **Value:** 6/10.



## DESTROYER



**T**ake the helm of a US Fletcher class Destroyer as well as the guns, depth charges, torpedoes, sonar, radar, navigation and damage control stations in a Danaborn-style multi-screen game.

Thirteen stations all together must be monitored and perfected if you are to complete one of the seven scenarios in which you must escort convoys, hunt submarines, rescue pilots and run blockades.

Each station has its own controls and impressive graphics ranging from the bridges bank of controls to the flip on the sonar screen.

After a mission briefing, you're on your own. Typing in two letter commands moves you between stations where you can plot courses or set depth charge depths ready for a submarine attack.

As the action heats up you will have to assign damage control crews, fight the enemy and keep the ship off dangerous reefs.

The game plays very well and soon you'll be fighting your way through the difficulty levels earning your stripes as a Destroyer captain.

Emperor is very similar in play and style to Microsoft's short lapped Sidet Server only this time you keep your head above the water.

T.H.

### Touchline

**Title:** *Emperor*. **Supplier:** US Gold (Oxford, Oxon) 241, Midford Way, Bofford, Birmingham B6 7AE. **Price:** £9.99. **Machine:** C64. **Originality:** 6/10. **Graphics:** 8/10. **Playability:** 6/10. **Value:** 9/10.

### FLASH GORDON

**F**lash, you're only got 30 hours to save the world! The evil Emperor Ming has targeted planet killer missiles at earth and you must stop him.

Unfortunately, the only way you can do this is to kill Ming before he fires them from the controls he always carries with him.

The mission hasn't started well as your ship crashed into a jungle instead of blowing Ming's palace apart. Now you have to search out Prince Barin and win his confidence (by beating him senseless) and ride to Ming's Palace on a bike he'll give you while fighting Ming's minions.

All this must be completed within 30 hours which isn't easy as you lose valuable time whenever a jungle monkey or snake chomps you or Prince Barin betrays you.

Luckily this 30 hours doesn't include loading time as the game plays in three parts and you must complete them in order.

Tit another excellent game in Mastertronic's M.A.D. series.

T.H.

### Touchline

**Title:** *Flash Gordon*. **Supplier:** Mastertronic, 4-10 Paul Street, London EC2A 4NN. **Machine:** C64. **Price:** £2.99. **Originality:** 8/10. **Graphics:** 8/10. **Playability:** 6/10. **Value:** 8/10.



### INFOBROID

**P**repare for the ultimate in excitement. A game based on computer messages that pick up and deliver parcels! OK, so the parcels are in fact custom built droids and it's set in the future but the action delivered by these futuristic Postman Pals is pathetic.

The transport system used by the infobroids is extremely silly and consists of canalsways split into four lanes travelling in each direction. Elation lane consists of a series of platforms that travel faster the further it is from the central canalsway. Down the centre of the canalsway are lift entrances to the companies that you deliver to and from, garages to repair your droid and junctions to get to the 14 other canalsways.

The result is that the droids must hop around these speed platforms like demented frogs until they finally find their destination. As for this game, it's going nowhere.

T.H.

### Touchline

**Title:** *Infobroids*. **Supplier:** Beyond Wellingborough House, Upper St Martin's Lane, London WC2H 9NN. **Price:** £1.79. **Machine:** C64. **Price:** £8.95. **Originality:** 6/10. **Graphics:** 5/10. **Playability:** 6/10. **Value:** 3/10.



### TRIVIAL PURSUIT — YOUNG PLAYERS' EDITION

**T**his is the first of Bomark's additional question packs planned for its Trivial Pursuit game.

This one's for the younger residents and contains two sets of questions for seven to 11 year olds and 12 years up.

The gameplay is identical to the original Census edition except the categories have now changed to Nature, Science/Technology, Art/Culture, Good Times, Games/Hobbies and People and Places.

While playing the game you can find out such fascinating facts as that silver is used to make film, who introduced Thai's Life, that the Atom-Head is Heidi's grandfather and the colour of a cricket ball.

This edition is available in two different versions either

as a complete game or as a 2000-question expansion pack for the original game.

Obviously this one's for the youngsters and will be good training for the Genius edition but who wants to be beaten by an eight-year-old?

Other planned editions include the Genius II and Baby Genius packs.

### Fourline

**Title:** *Trivial Pursuit - Young Players Edition*. **Supplier:** Dargatz, 264 Weyple Road, London NW20 6PN. **Machine:** C64. **Price:** (£14.95 (full game) (£7.95 (question pack)). **Originality:** 1/10. **Graphics:** 6/10. **Playability:** 9/10. **Value:** 8/10.



### MEDIATOR

When the Americans label was first launched, most people saw it as the label on which US Gold would dump all their games which failed the grade, thereby recouping some, if not all, of their losses. Time, however, has shown that although there have been some poor releases, on the whole, the label has maintained a very high level of quality; and with releases such as *Go For Gold*, the label has become a firm favourite with Commodore 64 owners.

All this said, the latest release, *Mediator*, may well be remembered by some of you as it was released, admittedly more than a few months ago, by English Software, a company which, in its time, has had quite a few hits. Why *Mediator* was not a hit is a matter for conjecture, but at £199, it really does deserve to make the grade.

The game is set long ago, when a doomsday machine was placed in high orbit above the satellites *Kylos* and *Phobos*, with a sole role to deter further attacks of nuclear war between the empires of the galaxy. If this satellite detects nuclear levels of nuclear activity, it will be activated, and it will then destroy both civilisations.

As the various of the galaxy, it is your task to locate the legendary *Good Mediator* to acquire the mythical time crystal, which will then allow you to solve all the problems of your galaxy. Graphically, *Mediator* shows its age in more ways than one. The actual animation is very good, but the



split screen has some raster problems, and the backgrounds are less than perfect.

The music too reflects the age of the game, especially the background music which is nothing short of atrocious. The fact is that this game is not trying to be sold at full price, therefore many criticisms must be ignored, purely because the game represents such excellent value for money. If you can stand the graphics and sound, then the game is as good as many more recent full priced games, with more than enough problems to last the average arcade game fan happy for many an hour.

### Touchline

**Title:** *Mediator*. **Supplier:** US Gold, Units 2/3, Wyford Way, Wyford, Birmingham, B6 7AE. **Tel:** 021 358 3388. **Price:** £199. **Machine:** C64. **Originality:** 6/10. **Playability:** 6/10. **Graphics:** 6/10. **Value:** 6/10.



### THE COM

By the year 2006 the Strategic Defence Initiative "Star Wars" system was in position and had been installed, worked and captured by aliens that turned it into a weapon

against the now powerful Earth.

Looking you as Nick "Daring" Diamond can still fly the only surviving anti-aircraft weapon and warp off to save the world.

Unfortunately, you only have a single firing laser and must blast away at the attacking aliens and the killer satellites over the planet rotating below.

The action is fast but also non-descript as you'll soon tire of this and look to the extra options such as a twin firing laser and displaying your score on the screen! However, these are selected from a menu while the game continues so you won't live long enough to appreciate them.

Yet another game where a good idea has been let down by a poor game.

**T.B.**

### Techline

*Title Defcon. Supplier: Quixotica, Victory House, Leicester Place, London WC2M 7NB. Tel: 01 439 1000. Machine: C64. Price: £8.95.*

*Originality: 8/10. Graphics: 3/10. Playability: 4/10. Value: 4/10.*

### TARZAN

**F**rom the western coast of the Congo, to the palm-fringed shores of Zanzibar, African folklore tells of the legendary exploits of one man, that man was Tarzan, Lord of the Apes. Left as an orphan in the jungle, Tarzan was raised by a shagape, Kala, and Tarzan learnt the laws and language of the jungle.

Only later in life was it discovered that Tarzan was really none other than John Clayton, Lord Greystoke. Whether or not he was a Peer of the Realm, Tarzan was still himself at heart, and whenever necessary he would don his leather kilt and swing, Whoomph-style through the trees.

Even as we speak, however, needs drove Tarzan to drag off the thin cover of civilisation and brave the perils of the jungle once again. Lady Jane Greystoke (her of "we Tarzan, you Jane" fame) has been abducted by Uanga, chief of the Wazato, and she will meet a terrible and agonising death, unless Tarzan retrieves the seven gemstones which have been stolen from the tribal shrine.



This is the setting for Marnoch's latest romp, and it could be the beginning of the end for anyone who loves addictive arcade adventures with a necessary far mapping. In three computer days, you must control Tarzan until you have finally collected all seven gems, and only then will you have any chance of saving Jane.

To help Tarzan, there are various animate and inanimate objects that must be collected, including ropes, monkeys and different coloured shields. Without these items, Tarzan will never complete his mission, so a keen eye is essential.

The first thing anyone will notice upon loading the game is Rob Hubbard's incredible soundtrack which, technically, must be his most impressive to date. With only 4k free, Rob has managed to get the whole Tarzan theme, complete with incredibly authentic bongos, as well as a host of effects including a nightmare section complete with sharpening whistles!

Once loaded, the quality of the graphics is also apparent. Nice backgrounds and an excellently animated Tarzan all add to the feeling of the game, although the time taken to fully-scroll the screen, and the manner in which it is done is less than impressive.

Tarzan is an excellent arcade adventure which together with games such as Amstrad, show the way for software companies to go. Even if the game was costing the Rob Hubbard music would justify the price, however it isn't, so how can you lose?

**P.J.**

### Techline

*Title Tarzan. Supplier: Marnoch, Marnoch House, Bay Terrace, Putney Bay, E Putney, SW24 6SE. Tel: 0213 78446. Machine: C64. Price: £8.95.*

*Originality: 8/10. Graphics: 7/10. Playability: 7/10. Value: 8/10.*

### THEY STOLE A MILLION

**E**ver wanted to plan the perfect crime from the comfort of your living room? Now you can using the S.W.A.G. (SoftWare for Aspiring Criminals) disk available through "What Crime?" magazine.

This database of headlines for hire, targets to be robbed





and times to sell the goods allows you to plan and execute enough jobs for you to rise from small time crook to Mr Big.

Using window menus, you can buy information and blueprints of your chosen target and select your team to do the job. Characters such as Charlie West and Detonator D'Arny have specialist skills that can be hired for a fee and usually a cut of the profits so you should shop around to find the right team.

Using the blueprint and a simple set of icons you can plan every step of the raid from disabling alarms to blowing the safe.

During the raid the Boss usually is the lookout (it's safer) and must freeze the action if a police patrol comes into view.

Success will lead you on to bigger and better jobs until you make a top security bank as you go for the million.

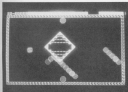
T.J.R.

### Touchline

**Title:** *They Stole a Million*. **Supplier:** Aristocrat, 58 Long Ave, London WC2E 9NW. **Machine:** CBA. **Price:** £8.95. **Originality:** 6/10. **Graphics:** 6/10. **Playability:** 7/10. **Value:** 7/10.

### STARBURST

**T**he CBA boom seems to have slowed down slightly, and with it, the number of really good games. One of the few games that really made the best of the little Commodore's graphics and colour was an offering from Aristocrat, called *Hyperbore*, and programmed by Tony Tatemachi.



Therefore, when the latest Aristocrat/Tatemachi offering was released, I was eager to get my grubby little hands on to the joystick and put it through its paces. However, if first impressions count, then this game failed to impress me. It seemed to me that the author had tried to cover up for the game's obvious roots by overcomplicating the gameplay, something that has seen many people fall flat on their faces.

Only after a few hours play did I start to find myself hooked, although why I was hooked I'm not totally sure. *Starburst* is basically a breakout derivative with some new touches and added gameplay. In order to keep the game interesting for more than a few minutes, there are three

different levels, all of which take some time to master.

The first level involves blasting at two balls at the top and bottom of the screen until they have been hit so many times that they become 'active'. Your ship then stops firing and turns into a large pong type bat, with which you must guide these two balls into their respective home slots. The moral of this screen is speed, as the faster it is completed, the more points are built up. If this level sounds too easy, there are some rogue balls to complicate it, and if you fail to achieve the objective before the two active gauges run out, then you must start a completely new game (no lives on this level!).

If you successfully complete level one, you are thrown into a bonus level, and it is here that points come free and easy, until time runs out. Level two involves blasting through a force field, from either the bottom or the top of the screen. As the forcefield shrinks, a number of coloured balls appear, and must be avoided at all costs, and at one point it gets so bad that there are eight balls flying around at breakneck speeds! As with level one, completion leads to a bonus level, which lasts as long as the amount of gauge time you have remaining.

Level three ought to be the most difficult, but it isn't! All you need to do is round up the Phantom Boulders by shooting them. Points are flying around here, with 500 available every time you complete the game. Reimbursement in many ways of an early *Miner* game, *Starburst*, at £2.99, represents excellent value for money, and should not be missed by any CBA/Plus 4 owner looking for a challenge.

T.J.R.

### Touchline

**Title:** *Starburst*. **Supplier:** Aristocrat, 58 Long Ave, Current Garden, London WC2E 9NW. **Tel:** 01 836 3411. **Machine:** CBA/Plus 4. **Price:** £2.99. **Originality:** 6/10. **Graphics:** 6/10. **Playability:** 7/10. **Value:** 7/10.



### CHAMPIONSHIP WRESTLING

**O**ver the past couple of years, one company above all others has stood out when it comes to sport simulations. That company is Epyx. Once again they have proved their

worth with Championship Wrestling. In general I am not a great sports fan. However, where computers are concerned, I feel that sports programs offer a fine medium of entertainment.

Basically the objective in Championship Wrestling, is to get rid of all opposition and become the Champion wrestler. As in most Epyx games, the more people that partake in the festivities the better. On loading up you are asked if you want to either practice, compete or see world records.

Obviously, to start with you choose the practice option. This allows you to get acquainted with all the various moves and joystick positions that are required. (I would suggest you get plenty of practice before doing battle with someone else.)

In the competition mode, if you are playing alone, you select a wrestler and then play each of the seven others in turn. With more than one player, each player will be asked to choose a wrestler. The computer then organises the matches and battle begins.

When playing in competitions, judicious selection of who you want to be is crucial. Each wrestler has his own style and strong points. Also each has one specialised move that none of the others have. So once again practice is recommended to discover each wrestler's effectiveness. (This move is known as the custom move.)

Overall, there are some 30 moves possible that each wrestler can perform. Unfortunately, there is not enough space here to go into each one in detail. Basically they are in eight groups: close to opponent, far from opponent, custom move, headlock, lift, airplane spin, opponent on mat and walking around ring. The use of certain moves depends upon your previous move. For example to give your opponent an airplane spin you need to be lifting him in the air. To be able to lift him, you need to have him in a headlock. To get him into a headlock you have to be close in. It's this interrelation of moves that makes the game that much more enjoyable.

There are one or two nice touches within the program. For instance, if you take your time the crowd will boo and hiss and wave banners. Throw your opponent out of the ring and the crowd go wild. All in all, this is a nicely presented game that with practice is quite playable and fun.

#### Touchline

**Title:** Championship Wrestling. **Supplier:** US Gold, Units 2/3 Halford Way, Halford, Birmingham, B8 7LL. **Price:** £9.95. **Originality:** 7/10. **Graphics:** 5/10. **Playability:** 8/10. **Value:** 8/10.

#### PARADROID

**F**or those of you that missed them first time round, Hewson has re-released two very popular '80 hits, Paradroid and Uridium, both programmed by Andy Braybrook. Paradroid is the same as before, except that it is much faster, whilst Uridium has lots of new ship designs. So what do you have to do?

Paradroid is simple, you are ordered to destroy a monstrous crew of Droids that have taken over a galactic freighter. To aid you in your task, you are issued with a 'Droid Influence' device. With this device you can take over and control Droids. (You can also simply blast them out of

their existence). The droids are scattered around the ship, which is made up of several decks. Obviously, things are not that easy. The droids are made up of varying power



strengths. The higher the droid number the better it is. Once you destroy all droids on one deck, the deck computer shuts down, and therefore all lights go-out. In other words the deck goes dark. One word of caution here. Do not think that it is simply a matter of blasting everything in sight on each level. There is a lot more strategy involved. My only real tip for you is proceed slowly.

Next question is, what weaponry have I? The influence device is fitted with low power twin lasers. The droids also have twin low power lasers. However as the droid number becomes higher, these its firepower increases. Two types of battle droids have disruptors, these you have to take over; you cannot shoot them. Transferring to droid is quite involved, but most of the strategy is applied to this part of the game. Decide which droid you wish to take over, stop and centre the joystick. Press the fire button and hold it down, then run the chosen droid. The screen will not change to what resembles a circuit diagram. The idea being to control the rectangular blocks by having your colour represented inside the block. You gain control of a block by moving your pulser up or down, then pressing the fire button at the required place. If after the time limit you have more of the blocks coloured in your colour transfer is complete. The higher the droid number, the more pulsers are made available to it.

To move around the different decks, find one of the lift's and press the button whilst you are standing on it. You may view decks, the whole ship, or droid capabilities by standing in front of one of the deck consoles that are scattered around.

I fairly enjoyed Paradroid the first time, but now that it has been made slightly faster in play, it becomes even more enjoyable.

#### Touchline

**Title:** Paradroid. **Supplier:** Hewson, Hewson House, 148 Midway Trading Estate, Milton, Abingdon, Oxon. OX14 4RL. **Machine:** C64. **Price:** £9.95 with Uridium. **Originality:** 8/10. **Graphics:** 8/10. **Playability:** 8/10. **Value:** 8/10.

## TRACKER

As Chandon, leader of an unscrupulous group of space pirates and mercenaries, you have been given a tough assignment. The outposts complex on the planet of Zogma IV has gone berserk. The computer that controls all facets of life on this planet of pleasure, has decided that it no longer needs human controllers. No problem, just switch it off! Wrong. This computer has a few tricks up its sleeve — if computers have sleeves — to stop you pulling the plug.

Not least of these are the Cyclone patrol craft, over which it has total control. These craft patrol the trackways that surround the computer complex, destroying anything in their path, this can be a problem if you are on the trackway at the time. Therefore, to aid you in your mission, you have been equipped with the best ships that Caliban can provide. To reach the computer centre it is necessary for you, along with a maximum of seven other ships, to traverse the trackways, knocking out communication centres and the cyclones.

Your ships are equipped with ion bombs, and forward firing lasers to accomplish this task. The bombs have very short fuses, so do not hang about too long. The C.P. complex consists of 32 interconnecting sectors, each with its own communication centre. You are initially beamed down to the 'Safe Sector', and can on knocking out a centre, beam down additional ships.



The game itself is displayed in three sections. At the top of the screen is a scrolling map centred on the current ship being controlled. Any enemies forces are also displayed on the screen. Half way down the screen is the status window. Shows here are the current conditions of all eight ships. Also shown here are whether they are under attack or not. On the left of this window, is a more informative display of your current ship in use. Along with this, there is an audience rating, a sort of score which continuously counts down. The better you do, the more points you clock up. Towards this is where most of the action takes place.

This screen has two functions. Firstly, it displays one of four maps, of varying scales. These are selected via the function keys. Alternatively, a 3D view through the cockpit can be called up. This is where all combat takes place. This screen is used when dropping bombs on Commes centres, and when destroying the computer itself.

This game comes well packaged, with a short novellet, to get you into the right mood. It is a good attempt at an

original game. The game itself is a very cunning and strategically orientated game, with underlines of the Star Wars trench sequences. At £12.95 this may be a little pricey for some people, but if you can afford it, you could do a lot worse than purchase this program.

## Touchline

**Title:** Tracker. **Supplier:** Ainsford Software, Wellington House, Upper Street, Morning Lane, London EC3M 4RL. **Price:** £12.95. **Machine:** C64.

**Originality:** 8/10. **Graphics:** 8/10. **Playability:** 9/10. **Value:** 5/10.

## URIDIUM

To succeed of Hewson's re-releases is Uridium. Fans of the game will only need to be told that this is the same as before but with some new superbships. For those of you that are new to this game let me expand.

The solar system is under attack from metal seeking ships, known as Super-dreadnaughts. These ships seek out and drain precious metal ores from the planets within your sector. Your task is to destroy the dreadnaughts before they exhaust all the different ores. Firstly, you must destroy its defences both on the surface of the ship, and those that fly around in attack groups. Control is by the joystick and is as follows. Up and down control your height above the ships surface. Left and right control your direction. Avoid structures on the ships surface that cast shadows, this means that they are high up. The dreadnaughts fighter defences deploy in waves, so be prepared for some nifty flying.

On the ship, the small coloured squares that flash, are also for the homing mines. These can be fairly easily avoided if they appear singly. Destroy as many of the surface defences as you can, whilst avoiding the fighters. Keep flying right, and be on the look out for a landing strip. Once the 'LAND NOW' signal is seen, land your craft as quickly as possible. The surface fighters become very intelligent at this point.

On safely landing, you are then presented with the bonus screen. It is up to you to gain as many points as possible, before flying over the dreadnaught for the final strike run. I have to be honest, and say that normally, I am not into shoot and blast run type of games. My forte being text only Infocom. However, when Uridium first came out, I must confess I could not stop playing it. There is something about this program that puts it in the same class as Boulderdash 1, 2 and 3. I am pleased to say that this re-release lives up to its predecessor. The new dreadnaught designs are done really well. And quite a few of them will have you pulling your hair out. The designs are in the same class as before, with one or two extra characters re-defined.

## Touchline

**Title:** Uridium. **Supplier:** Hewson, Hewson House, 266 Abchurch Lane, London, EC4N 3AB. **Price:** £9.95 with Finalbird. **Machine:** C64. **Price:** £9.95 with Finalbird.

**Originality:** 7/10. **Graphics:** 8/10. **Playability:** 9/10. **Value:** 9/10.

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**Abstract**



# Joystick Read

*Here's a time saving and invaluable joystick routine for Basic programmers in league with a C64.*

*By Nick Samner*

**H**ow many sleepless nights have you spent wishing that there was an easier way to read the Commodore's joystick ports through Basic. One that was much faster and easier to understand. Well, luckily enough, here is that routine! Read on to find out more.

subroutine, BUT, they must be in that order, and before any other variables.

Next, do not call this routine twice within your program or the computer may crash or BASIC may be corrupted!

For all m/c enthusiasts, there is a disassembly included. The interrupt routine shown can be used for smooth

scrolling, more than eight sprites or other master tricks.

The test program included allows you to move a white block around the screen with the joystick, and the fire button will make the border colour change (well, it's only a demo!).

I hope you enjoy using this routine in your own programs.

## In Use

This joystick utility has been designed to help those who are Basic programmers, but who want to add that professional touch to their programs. Using this routine for a joystick in Port 2 could just do that!

The actual routine is on an interrupt and so doesn't waste Basic's time for GOSUBS etc.

Two Basic string variables are used to store the joystick information, so no PEEKing is needed either!

However there are a few things that you will need to know before you can use the routine, or read on!

Because the routine uses two string variables, these need to be set up by the programmer, before any other variables are defined or the machine code routine is called. This is what to do!

In your program:

```
10 JOG="" : FIRE="" : OFF="" : SYS 1276
```

JOG and FIRE must be set like this either at the first line or in a

## JOYSTICK ROUTINE DISASSEMBLY

```

10000 10000 002 = SCPP
10001 10001 000 = SCPP
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1392	LDW #R00	1	PLACE REG11 "R" INTO MEMORY
1394	LDW #R013		
1400	CLD	1	DATA INTERRUPT ENABLE STATE
1402	RTD		RETURN TO STATE
1500 RT	LDW #R00	1	CHECK FOR INTERRUPT OCCURRING
1502	STP #R000		
1504	BRW #R000		
1510	BRW #R001	1	JUMP TO ENTER ROUTINE
1512	LDW #R01	1	SET REGISTERS FOR WORK
1514	LDW #R00		
1516	STW #R001		
1520	LDW #R00		
1522	LDW #R00		
1524	STW #R00,Y		STORE FOR
1526	LDW #R000		READ ADDRESS
1528	BRW #R001		SET ONE DIRECTION
1530	BRW #R01		IF NOT GOOD GO ON
1532	LDW #R000,C		GET REG11 VALUE
1534	STW #R00,Y		STORE IN RAM
1536	BRW #R00		GO TO FIRST BUFFER CHECK
1538	BRW #R001	1	ENABLE COUNT
1540	LDW		
1542	LDW #R00	1	ALL DIRECTIONS CHECKED
1544	BRW #R001		
1546	LDW #R00	1	SET PINS TO "OFF"
1548	LDW #R00	1	END SERVICE LENGTH GO TO
1550	STW #R001,Y		
1552	LDW #R00		
1554	LDW #R00		
1556	STW #R001,Y		
1558	LDW		
1560	LDW #R000	1	READ ADDRESS
1562	BRW #R00		GET FIRST BUFFER
1564	BRW #R00		IF NOT BUFFERED THE GO TO STOP
1566	LDW #R00		CHANGE FLAG TO "ON"
1568	LDW #R00	1	INCREASE LENGTH OF PINS TO 20
1570	STW #R000,Y		
1572	LDW #R00		
1574	LDW #R00		
1576	STW #R001,Y	1	SET NEW BUFFER POSITION
1578	LDW #R00		
1580	LDW #R01		
1582	BRW #R01		
1584	LDW #R01	1	RESET INTERRUPT FLAG
1586	STW #R001		
1588	BRW #R00	1	GO TO BUFFER ROUTINE

[illegible]

### PROBABLY THE BEST ROUTE

[illegible]

PROFESSOR, UNIVERSITY OF THE SOUTH ALABAMA

[illegible]

# Hard Copy

*One of the biggest investments which a computer user makes is inevitably a printer. For this reason we've put a new Citizen model through its paces.*

*By Mycroft Appleby*

**T**he Citizen LSP-10 printer is one of the low end price bracket printers that is making Citizen a very big name in the peripherals world at the moment.

It's easy to see why Citizen has come to the surface. The LSP-10 is a full width printer with all the facilities found on the more expensive Epson along with NLQ and tractor-feed options. Externally, the machine is a lot smaller than its immediate opposition, its dimensions being 180mm wide, 155mm deep, and 98mm high. The control buttons comprise the usual on/off line, first feed, and form feed. With indicators for power, paper out, and ready. The camera trend towards setting the print options (i.e. bold, italics, NLQ etc.) from the front panel is not supported here, which is a shame - but this is a low cost printer.

## Paper and Print

The paper advance knob is well mounted on the right of the machine immediately above the interface connector. Having the interface on the side of a printer is most unusual as most printers have them on the back. But when you think about it, the side is a most logical place to attach cables as they then don't foul the paper feed. The paper cable does attach at the back, but it at one corner and has a 90 degree bend on it to make the cable emerge sideways.

The printer comes as standard with friction feed, but a tractor option is available. This feeds the paper in very easily and is one of the most trouble free paper feeds that I have come across. The friction feed can also be supplemented by a sheet feeder that can feed correspondence quality paper to complement the NLQ print. Paper loading is trouble free to an extent that I hadn't thought existed after using the Epson method of loading paper. When there is no paper in the machine, the

form feed button doubles as an auto-paper load button that takes the paper from the back of the machine to in front of the print head.

Print speed varies between 24 characters per second in NLQ mode and 120 cps when printing draft. The draft output isn't bad, but obviously isn't as good as you would expect for a printer whose main selling point is that ability. With the LSP-10 it is more of a bonus. The NLQ in this case should be considered as just an order to email matrix font, you wouldn't write a letter to your bank manager with it.

## Interfacing

As is becoming common nowadays the interface is on a cartridge. The one I had was a centronics parallel type, but I believe a Commodore serial one is available. The cartridge is flush fitting and is shaped in the same way as the bottom of the case. Unless you know that it is there, you wouldn't even suspect it. A well thought out point with the cartridge is that the dip switches are on it. These are the switches that set up the different start up options and functions on the printer. Usually you have to scrape around the inside of the printer or even open up the case with a screwdriver. But with the LSP-10 you can remove the cigarette packet sized unit and have it in front of you whilst you consult the manual.

The dip switches in this printer are more important than in most as they set the emulation mode of the machine. The printer is capable of emulating the popular (i.e. around 60% of the market) Epson range of printers to a greater or lesser degree. This means that if you ever have some-clone software for example, you may find that it has an Epson option on it. One of the three Citizen

emulation modes should suffice. It can also emulate the less popular, but business standard, IBM graphics printer. But as you don't often find these on Commodores, you probably won't ever need it.

## Documentation

The manual is a sturdy tome, in a spiral binding that lays flat (very useful). The concept and features of the printer are introduced in a logical manner with worked examples, sample outputs, and diagrams. At the end of the manual there is a tear-off card with all the most common escape codes indicated. This saves a lot of time as I usually have to dig through the manual, making it extremely dog-eared, to extract the relevant information.

All the escape codes and functions are based around the common Epson standard with the usual bold, double strike, compressed, expanded, italic, or correspondence quality styles supported. The graphics capability is also good with three graphics densities up to around 1820-dots on an eight inch line. There is also two speeds for the medium density print to improve quality in the cost of reducing speed. You can also define your own characters on the 1199 print buffer if you discard the 2K printer buffer.

## Verdict

Overall I can safely say that having used the printer on regular basis for the last month, that I am extremely happy with it. It provides most of the facilities of the most popular printer in the world, with none of the little idiosyncrasies that put the name of Epson covered cost, and at a much more reasonable price. Definitely the top of my list for printers at the moment. **B**





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# Hex Data Entry

*Introducing the Your Commodore Hex Data Entry Program to make our listings even more accessible.*

*By M.C. Stretton assisted by P.A. Ever*

**T**he Your Commodore Hex Data Entry program has been written with you, the reader in mind. No longer will it be a painstaking ordeal, typing in all the long lists of data. This program will ensure a 100% correct entry, each and every time you use it.

I have made this routine as straightforward as possible so as to save you having to type in a large program. There are only four options in this version: LOAD DATA; SAVE DATA; ENTER DATA; PRINT DATA. There will be a much larger version coming shortly which will give lots more options and will have Windows, Redefined Characters, Scrolling Text etc.

On first entering the Hex Data Entry, only the LOAD DATA and DATA ENTRY options are available to you. This is because the buffer is empty, and the other two options require data to be present. On selecting the LOAD DATA option, you are asked for TAPE or DISK. From either 'T' or 'D' then RETURN. The program remembers that last input/output, and so it is possible to just hit RETURN if the correct device type is being displayed. You are then required to enter a filename.

Type users please note, to cut down on errors for disk users, you will not be allowed to enter a blank filename. Filenames can be a combination of any characters, except graphics, up to 16 in number. If you should make an error in your filename entry, you may either delete single characters by the DEL key, or SHIFT+CLRHOME will delete the whole filename. Be extremely careful when typing in your filename, errors can be fatal, so make sure you only use filenames that are stored on whatever device you are using. After the prompt, hit return and the file will be loaded into the buffer. The program will allow files up to 99 blocks in length to be loaded in. If you want larger programs entered, you will have to split them into two or more parts first. After the load, control is passed back to the main menu.

The save option is identical to the load, except that it takes the contents of the buffer and saves them out to the given start address. This will save an executable file, that can be loaded and

run, independent of the input program.

## Data Entry

The Data Entry option is the option by which you can enter data from Your Commodore, or your own creations. Once this option is selected you are asked if you want to continue from the given address. If you have just 'LOADed' a file, this address will be the most available byte in the buffer. (Allowing you to add more data to the end of the loaded file). This is also true of the program currently in memory. Therefore if you wish to continue typing in at the last address, type 'Y'. If 'N' is pressed the program assumes you are starting a fresh entry. When this happens the buffer is reset to zero, thus losing any program currently in memory. (I have chosen \$C000 as the normal start up address purely because most MC-C prgs made here.) After pressing 'N', you are then asked for the starting address, in Hex. Any valid Hex number is acceptable, e.g. \$400, \$100, \$0400. In this example, the first figure, \$400, would be interpreted as \$0400 by the program, likewise \$255 is taken to be \$0255.

Once the start address is given, you are asked if you want checksums or not. If you are typing in a program from Your Commodore your response will be 'Y'. If you are entering your own program then select 'N'.

The screen display now changes to show the current address being pointed into. Type any valid Hex number and the program automatically skips the next byte without the need to type commas, spaces or returns. If you make a mistake, one press of the DEL key will erase the whole number. If in the no checksum mode, when you get to the end of the line, the line will automatically scroll up ready for your next input.

If in checksum mode, after eight bytes are entered you must type the two digit checksum at the end of the line. Unlike the no checksum mode you now press return to enter the line.

If the program finds that the checksum does not match the line entered, a warning tone will be sound. You will then be asked if you wish to either: a) Re-enter the line or b) Re-enter the checksum.

After checking your line, if you do you have entered it wrongly, then get 'C'. The line will be erased and so there re-enter it correctly. If you find that you have only made a mistake typing in the checksum, then press 'I' and re-enter it. Should you wish to stop entering data, simply press return or space bar on a blank line to get you back to the main menu. Here you may save your program so as to re-use another day, or you may wish to exit program.

On choosing the print option, you have a choice of hard copy or save copy. The listing can be paused at any time by pressing down and holding down any key. Pressing a RUN/STOP key and holding a dot will load out of the print mode and return you to the main menu.

The left arrow key 'top left of a keyboard', acts as soon when typing your data. The space bar acts as it returns key when entering data, thus leaving you free from searching for a return key.

The load option allows a program, less than 95 blocks, to be loaded into the buffer, so it is possible to load a large program, obtain a file dump, then re-use the program on another tape or disk without having to do it any way.

I hope that this program will help make the drudgery out of typing in lots of data statements.

```

PLEASE use SYSTEM CRIBSHEET
when entering this program

00 10 NEW ----- SETUP -----
01 20 POWERON,SE,CLR "
02 30 $A=0:$B=10000:POKE$B,0
03 40 $A=$A+$B:POKE$B,$A
04 50 $B=$B+$A:PRINT"CLR,NEW $
05 60 "
06 70 NEW USE NOTES ON CRIB S
07 80 LISTINGS FOR DETAILS ON
08 90 NEW NEW CHARACTERIS
09 00 NEW "RECORD",CR-VOL100
10 10 "
11 20 $B=0
12 30 $B=0
13 40 PRINT"CLR"
14 50 NEW ----- OPTION -----
15 60 "
16 70 PRINT"CHGE,PUOFF,BLAC
17 80 PRINT"INCH,BLACED YOU
18 90 COMPOSED WITH INPUTER - 0
19 00 "
20 00 PRINT"DR45000 - $010000
  
```

1990-1991

100

[illegible]

# Superbowl Sunday

*American football fans wake up. We bring you the chance to win a copy of the new Nexus football game.*

In the aftermath of the actual Superbowl final between the New York Giants and the Denver Broncos, we've decided to prolong the spirit of the occasion by running a special American football competition.

Nexus has recently released a new game to their fans, entitled *Superbowl Sunday*. Now C64 owners can experience the real excitement of a Superbowl final.

We have 50 copies of this C64 game to give away, so read on to find out how you can be the new keyboard refrigerator.

## How to Enter

Study the two pictures on this page. There are several differences between them. Mark the differences which you can find and then fill in the coupon. Please write the number of differences which you have found on the back of your envelope, if you forget to do this, your entry will be void.

## The Rules

Entries will not be accepted from employees of Argus Specialist Publications and Nexus. This restriction also applies to employee's family and agents of the company. The How to Enter section forms part of the rules. The editor's decision is final and no correspondence will be entered into.



## Superbowl Competition Entry Coupon

Name .....  
Address .....  
.....  
.....  
postcode .....  
Number of differences found .....

Send your entry to: Superbowl Competition, Your Commodore,  
1 Golden Square, London W1R 3AB. Closing date Friday 27 March 1983.

# WIMPS and Much More

*For those of you who found our WIMP Program useful,  
here are a couple of additions to make it easier and  
more enjoyable.*

*By Allen Webb*

**E**ase of use is often a major factor taken into consideration by programmers when they are summing up a program's usefulness. This is why I have decided to provide this addition to the Wimp program which appeared in the December 1986 issue of *Your Commodore*.

After writing the demonstration routine, I felt that, while it has instructive, it didn't give you anything to work from. I have therefore prepared a universal menu routine to use with the package. This routine is given in Listing 1.

The meat of the routine occupies lines 60000 onwards. To use the routine you must first pass the following parameters:

```
MES: MENU STRING
MW: MENU WIDTH
MH: TOTAL MENU HEIGHT
XL: X COORDINATE TOP LEFT CORNER
YL: Y COORDINATE TOP LEFT CORNER+1
CLC2 MENU COLOURS
```

The routine will then draw the menu and set up the pointer. The routine detects the movement of the pointer and highlights the menu options or "last page" icon when they are pointed to. The button press is detected if an option has been selected and the routine exits with the following information:

```
TASK=OPTION SELECTED
LP=0 IF MENU ITEM
LP=1 IF LAST PAGE
```

You can use the values of TASK and LP to direct the logic of the rest of your program.

## Input Instructions

The idea of this series is to provide a set of routines which can be used in more serious applications to reduce the toil of programming.

One pain in the neck is the INPUT instruction. Most software requires the input of information and it is of course that such operations are both user friendly and idiot-proof. The Basic INPUT has several drawbacks and is not suitable for serious software. Many programmers use either GET or INPUT using a logical file opened to the screen.

It becomes particularly irritating if you want to limit the characters to be accepted. For example, what if you want to prompt for a response using only Y or N? One way is the routine:

```
10 GET B: IF B< > "Y" OR
15 < > "N" THEN 10
20 IF B="Y" THEN...
```

This is simple enough but if you want to accept a larger group of

characters, the routine becomes messy.

The use of a user defined input routine appeared to be the answer. Such a routine should have the following features:

- 1) The routine should provide a flashing pointer, easily placed at a specified screen position.
- 2) A list of acceptable characters should be easily set up.
- 3) The routine should image the input to screen to allow the user to see what has been input. The ability to delete incorrect characters should be available.
- 4) The input should be easily limited to a specified length. The input should ignore the screen contents. This will allow the use of formatted displays.
- 5) The input should be returned in a specific string variable.
- 6) The routine should ignore a null input.

Such a routine is given in Listing 2. This routine provides all of the features described (the DEL key is used to correct inputs).

This routine has a rather peculiar syntax:

```
SVS I2=4096,BL,AB,X,N,IL
```

where:

BL: string to hold input  
AB: string specifying acceptable



characters

X X coordinate of input prompt  
Y Y coordinate of input prompt  
L length of input

### Listing 3

```
100 A$="ABCDEFGHIJKLMNO"  
Q$="PQRSTUVWXYZ"  
110 A$=A$+"123456789+-*/%<>"  
120 L:=LEN(Q$)*"PQRS"*(COLS-8)+  
8+CHRS(2)*NEXT  
130 ST$="1+2=3,4,5,6,7,8,9,10,11  
140 PRINT CHR$(148)  
150 GET:IF IS=" " THEN GOTO
```

In Listing 3 lines 100 and 110 set up the list of acceptable characters in A\$. The input length is limited to 10 in line 20 variable L1. B\$ is set up with 10 spaces. Line 111 will hold the input and must clearly be long enough to hold the 11 input. Line 140 gets the input with a prompt at the start of line 11.

The routine will put the input at the place where B\$ is defined. If, for example, you replaced line 140 with:

```
140 L1=LEN(B$)-1:PRINT
```

If, after using the routine, you were to list the program, you would find that line 140 had been altered. The reason is that if a string is defined in a program, then Basic doesn't bother saving up the string elsewhere. Using the form given in Listing 3 forces Basic to set up the variable B\$ and therefore prevents corruption of the program.

Listing 4 gives a demonstration of a simple menu requiring a single key input. It should show how easy the routine is to use.

### Listing 4

```
100 A$="DEMO"  
110 L1=LEN(CHR$(32))  
120 PRINT CHR$(147);CHR$(17)  
TAB(0);"MAIN MENU"  
130 PRINT CHR$(17);TAB(14);"  
INITIALISE"  
140 PRINT CHR$(17);TAB(14);"  
ENTER RECORD"  
150 PRINT CHR$(17);TAB(14);"  
DELETE RECORD"  
160 PRINT CHR$(17);TAB(14);"  
SEARCH"  
170 PRINT CHR$(17);TAB(14);"  
PRINT REPORT"  
180 PRINT CHR$(17);TAB(14);"  
SELECT OPTION BY ENTER-  
ING"
```

100 PRINT TAB(7);"INDICATED  
KEY & PRESSING"  
200 PRINT TAB(7);"RETURN"  
300 ST\$="1+2=3,4,5,6,7,8,9,10,11  
400 PRINT CHR\$(17);TAB(14)  
CHR\$(148)" WAS SELECTED"

That's all for this month. I haven't decided what to tackle next time but I'll think of something. Don't forget, let me have your comments (preferably no abusive) and suggestions via the editor.

#### PROGRAM LISTING 3

```
100 A$="ABCDEFGHIJKLMNO"  
Q$="PQRSTUVWXYZ"  
110 A$=A$+"123456789+-*/%<>"  
120 L:=LEN(Q$)*"PQRS"*(COLS-8)+  
8+CHRS(2)*NEXT  
130 ST$="1+2=3,4,5,6,7,8,9,10,11  
140 PRINT CHR$(148)  
150 GET:IF IS=" " THEN GOTO  
160  
170 IF LEN(B$) > 10 THEN B$=""  
180 IF LEN(B$) > 10 THEN B$=""  
190 IF LEN(B$) > 10 THEN B$=""  
200 IF LEN(B$) > 10 THEN B$=""  
210 IF LEN(B$) > 10 THEN B$=""  
220 IF LEN(B$) > 10 THEN B$=""  
230 IF LEN(B$) > 10 THEN B$=""  
240 IF LEN(B$) > 10 THEN B$=""  
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980 IF LEN(B$) > 10 THEN B$=""  
990 IF LEN(B$) > 10 THEN B$=""  
1000 IF LEN(B$) > 10 THEN B$=""
```

#### PROGRAM LISTING 4

```
100 A$="DEMO"  
110 L1=LEN(CHR$(32))  
120 PRINT CHR$(147);CHR$(17)  
TAB(0);"MAIN MENU"  
130 PRINT CHR$(17);TAB(14);"  
INITIALISE"  
140 PRINT CHR$(17);TAB(14);"  
ENTER RECORD"  
150 PRINT CHR$(17);TAB(14);"  
DELETE RECORD"  
160 PRINT CHR$(17);TAB(14);"  
SEARCH"  
170 PRINT CHR$(17);TAB(14);"  
PRINT REPORT"  
180 PRINT CHR$(17);TAB(14);"  
SELECT OPTION BY ENTER-  
ING"  
190 IF LEN(B$) > 10 THEN B$=""  
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990 IF LEN(B$) > 10 THEN B$=""  
1000 IF LEN(B$) > 10 THEN B$=""
```





## Checksum Program

The hexadecimal numbers appearing in a column to the left of the listing should not be typed in with the program. These are merely checksum rules and are there to help you get each line right. Don't worry if you don't understand the hexadecimal system, as long as you can compare two characters on the screen with the corresponding two characters in the magazine you can use our line checking program.

Type in the Checksum Program, make sure that you've not made any mistakes and save it to tape or disk

immediately because it will be used with most of the present and future listings appearing in *Your Commodore*.

At the start of each programming session, load Checksum and run it. The screen will turn brown with yellow characters and each time you type in a line and press the RETURN key a number will appear on the screen in white. This should be the same as the corresponding value in the magazine.

If the two values don't relate in one another, you have not copied the line exactly as printed so go back and check each character carefully. When you find the error simply correct it and

press RETURN again.

If you want to turn off the checker simply type SYS49152 and the screen will return to the familiar blue colour. You can then do whatever it was you wanted to do and if this doesn't use the area where Checksum lies you can go back to it with the same SYS command.

No system is foolproof but the chances of two errors cancelling one another out are so remote that we believe our listings are more reliable than any other magazine in the world. So get typing! □

and just printing

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### Mnemonic Symbol Keypress

(RIGHT)		CTRL left/right
(LEFT)		SHIFT & CTRL left/right
(DOWN)		CTRL up/down
(UP)		SHIFT & CTRL up/down
(F1)		F1 key
(F2)		SHIFT & F1 key
(F3)		F2 key
(F4)		SHIFT & F3 key
(F5)		F3 key
(F6)		SHIFT & F5 key
(F7)		F4 key
(F8)		SHIFT & F7 key
(HOME)		CLR/HOME
(CLR)		SHIFT & CLR/HOME
(BASIC)		CTRL & +
(SYSTEM)		CTRL & +

### Mnemonic Symbol Keypress

(BLACK)		CTRL & 1
(WHITE)		CTRL & 2
(RED)		CTRL & 3
(CYAN)		CTRL & 4
(PURPLE)		CTRL & 5
(GREEN)		CTRL & 6
(BLUE)		CTRL & 7
(YELLOW)		CTRL & 8
(POUND)		#
(LARGER)		+
(SMALLER)		-
(PI)		SHIFT & +
(INST)		SHIFT & INST/DEL
(REV T)		rev test
(Letter)		CTRL + letter
(Screen)		SHIFT + letter

# Software for sale

*If you think that one of our programs looks very interesting, but you can't afford the time to type it in then our software service will help you out.*

**I**t's three o'clock in the morning. You sit at the computer keyboard just finished a marathon typing session quoting one of the superb programs from Your Commodore. Your fingers reach for the keyboard and press the letters R, U and N. You press RETURN, sit back and nothing happens.

Everyone has probably faced this problem. When it does happen it's a matter of spending hours searching through the program for any typing mistakes. No matter how big as you look or how many people help you, you can usually guarantee that at least one little bug slips through unnoticed.

The Your Commodore Software Service makes available all of the programs from each issue on both cassette and disk at a price of \$6.00 for disk and \$4.00 for cassette. None of the documentation for the programs is supplied with the software since it is all available in the relevant magazine. Should you not have the magazine then back issues are available from the following address:

INFONET LTD, Times House, 179 The Marston, Hemel Hempstead, Herts. HP1 1BB.  
TEL: (0442) 48435

please contact this address for prices and availability.

## The Disk

Programs on the disk will also be supplied as totally working versions, i.e. when possible we will not use Basic Loaders thus making use of the programs much easier. Unfortunately at the moment we cannot duplicate C16 and Plus/4 cassettes. However programs for these machines will be available on the disk.

What programs are available?

At the top of each article you will find a strap containing the article type, C64 Program etc. So that you can see which programs are available on which format you will also find a couple of symbols after this strap. The symbols have the following meaning:



This symbol means that the program is available on cassette.



These programs are available on disk.

## Please Note

Since the programs supplied on cassette are total working versions of the program, we do not put disk only programs on tape. There is no point in placing a program that expects to be reading from disk on to tape.

## OCTOBER 1986

**CROSSWORD** — Put your wits against your computer.  
**POPUP MENUS** — A useful routine that allows you to add pop-up menus to your C64.  
**PILOT** — A full implementation of this extremely popular educational language for your C64.

ORDER CODE  
DISK YDC/CT64 £6.00  
TAPE YDC/CT64 £4.00

## NOVEMBER 1986

**Into The Eighties** — now you can give your C64 80 column capability, with this program. You have access to 80 screens either the 40 column version or the new 80 column one.

**C16 SOUND SAMPLER** — now your C16 or Plus/4 can sound like any instrument you like with this sound sampler. Available on disk only.

**C64 AUTOSAVE** — You've been programming for hours and your computer crashes taking all of your work with it. Well, you can prevent this with our C64 Autosave. This will save your programs to disk or tape every five minutes automatically so you won't have too much work to catch up on.

**DATAMAKER 128 & C64** — Two excellent database programs one for the C128 and one for the C64.

ORDER CODE  
DISK YDC/CT64 £6.00  
TAPE YDC/CT64 £4.00

DECEMBER 1986

**NDP** - Create your own graphics operating system in your own programs. Complete with pull down menus and sample icons.

**REMEMBER THE PLUS/4** - An assembler for Plus/4 owners. Complete with a couple of new Basic commands including a MERGE facility.

ORDER CODE

DISK TDD0C86 £6.00

TAPE YDD0C86 £4.00

JANUARY 1987

**SELECT MENU 128** - Add a menu program to your C128 disk collection.

**DISK ARCHIVE** - Now you can make a total backup of all you disks on to cassette for safe keeping. A complete disk too for minutes of tape (C64).

**TAPE READER** - Find out where your cassette based programs start in memory. For the C16 (Jan Disk only).

**ADDRESS** - Generate your own animated character sequence with this program for the C64.

**DUMPER** - Produce copies of your Plus/4 text and Hi-res screens with this handy screen dump program (Jan disk only).

ORDER CODE

DISK YDD0A87 £6.00

TAPE YCD0A87 £4.00

FEBRUARY 1987

**TURBO MENU/ MAKER** - Add menus and high speed loading to your disks (C64 - disk only).

**HIS DATA ENTRY** - Your Commodore program entry system.

**X-RAY FILE** - Get more information from your disk drive (C64 disk).

**ADVENTURE AID GRAPHICS** - Easy graphics for our Adventure Creator system.

**LABELLER 84** - Easy addressing with this label printer for the C64.

**WORD PRO ADD ON** - Add descriptors to your MPS 681 printers with the Plus/4 word processor.

**NURSERY RHISIDE LAND** - An educational adventure for the young ones.

ORDER CODE

DISK YDD1B87 £6.00

TAPE YCD1B87 £4.00

Cassettes or disks are available back to March 1986. Please ring the Editorial office (01-437-0626) for details of these.

ORDER FORM - PLEASE COMPLETE IN BLOCK CAPITALS

NAME	QTY	TAPE/DISK	ORDER CODE	PRICE
March '87		TAPE (£4.00)	YC MAR 87	
March '87		DISK (£6.00)	YC MAR 87	
OVERSEAS POST £1				
			TOTAL	

NAME .....

ADDRESS .....

POSTCODE .....

Enclose a cheque/postal order for £..... made payable to ARGUS SPECIALIST PUBLICATIONS LTD.

All orders should be sent to: YOUR COMMODORE, READERS SERVICES, ARGUS SPECIALIST PUBLICATIONS, 9 HALL ROAD, HEMEL HEMPSTEAD, HERTS HP2 7DH.

Please allow 28 days for delivery.

# CP/M: The Third Facet of the 128

*The C128 has three modes - 64, 128 and the much neglected CP/M. In this article we bring you a pocket guide to CP/M and shed light on its uses.*

*By Mycroft Appleby*

**T**he Commodore 128 comes with CP/M+ as the operating system for the built-in 280 second processor. However, the documentation is sparse and confusing, and information on the supplied utility software is rare. Read on and, you may hear something to your advantage.

CP/M started life as a monitor for the newly introduced Intel 8088 processor evaluation kit and was written by one of its employees. CP/M in those days (1979) stood for Control Program/Monitor. This monitor handled things like the paper tape reader and writer, punched cards, and a line printer, as well as the teletype console to which it was attached.

After a short while, Shugart came on the scene. Shugart had just developed the mini disk drive by shrinking the normal eight inch IBM drives down to a handy five inch size. The problem was that they had no real software to make them work. So Shugart asked the chap who wrote CP/M if he could do something with them and make the whole system work together. This was duly done, and the early CP/M had taken shape.

Intel, however, didn't want to market this program, so the chap left

Intel, worked off the bugs in the program out, set up his own company, and CP/M 1.4 was launched on an unimpeachable public.

The company started out life called Intergalactic Digital Research, but a bank manager probably talked them into dropping the 'Intergalactic'. CP/M was further refined into CP/M 2.2 and the 'standard' CP/M system was defined as a 280 processor, 64K of memory, between one and eight disk drives, and an 80 x 25 screen. As long as your system had these minimums, software would run. This held immense attractiveness for software houses as instead of writing dozens of different versions of a program for all the different machines, they could just write a CP/M program and put a little program on the same disk that would ask the user to describe what was different about the CP/M system from everybody else's, and you're away.

At about this time CP/M was deemed to mean 'Control Program/Microcomputers', as it was thought that commanding people that this program was just an easy way to hook up paper tape punchers to 8088 development systems (a development system looks like a circuit board, with

a calculator display and a small keypad - that's it!) would just confuse them - they were probably right though when you know that, explains a lot of things!

In around 1980 memory was getting a bit cheaper and all sorts of dodges were being used to get more memory into CP/M systems than 64K allowed for (64K in 1979 is incomprehensibly huge). So it (Digital Research) wrote CP/M 3.1. CP/M+ is cater for it. Up until now CP/M contained a number of programs. A boot-ROM that loads CP/M off disk and into memory, BIOS or Basic Input/Output System to handle the paper tape/keyboard/printer etc, a BIOS to handle the disks, and the CCP - or Command Processor, which does all the dosing work. All of these together take up about 12K - though can vary depending on the machine. Take out the screens and a small bit for variables and the TPA or Trans Program Area (the place in memory that the programs actually go to load and start to shrink). So even with 48K TPA, running a business program may only give you 18K to play around with - not a lot at all.



What CP/M+ does is to allow the 280 to have 128K in a banked system. It's puts the screen, BIOS, BDOS, CCP, and RSXs (more of those later) out of the way, and leaves TPA, of about 68K. This still may not sound like a lot, but applications programs can also use the banked memory - so you may still have around 30K to play around with for data - a much better state of affairs. DR also took the opportunity to 'clean up' some of the dodgier bad points of CP/M 2.2 and make it work a lot more user - friendly. CP/M+ also uses RSXs more efficiently by storing them out of the way, when the main program is working, what's an RSX? It's a Resident System Extension. This will expand the capabilities of CP/M in some way. It is mainly used for the GDS system which is a logical, machine independent way of handling graphics.

DR also launched a number of new products at this time - CP/Nut for networks, MP/M - for multi user applications, and Personal CP/M - for smaller machines without disk drives. However, their drive for world domination in the business operating system market was killed stone dead in a couple of months by the emergence of the IBM PC and it's operating system called MS-DOS - written by DR's arch rival Microsoft (who started in a very similar way to DR, except that they were called The Kentucky Fried Software Company, and began by writing a program called Basic - but that's another story). MS-DOS was written from scratch as a 'real' operating system, and not as a box monitor, and

it showed. It was friendly, fast, (relatively) bug-free, and could access 640K of memory. Business men flocked to it in droves. DR eventually recovered with a program called GEM (Graphics Environment Manager), but that's also another story!

### The C128 and CP/M

Most people know that a C128 has two processors a 280 and an 8502. Both can have access to the 128K of main memory, and both can have access to the 16K of video memory (yes, that's right - your C128 is actually a C144, but that would probably only confuse people). What most people don't realise is that the 280 is the main processor and has priority, and that the 8502 is actually the second processor! When you turn on a C128 (with a disk drive attached) the disk whirrs. This is the CP/M boot ROM trying to load CP/M off disk. If it doesn't manage it, it gives up and grudgingly lets the 8502 have its evil way.

Remembering what I said about the minimum system configuration for CP/M I will assume that you are using a C128 with at least one disk drive, and the 80 column screen facility. You can use the 40 column screen, but this is a window on a logical 80 column screen - much better to use the real thing - also as the 80 column screen has its own 16K memory, you don't loose the odd couple of K here and there.

So pop in your system disk (that with CP/M on it) and give your C128 screaming and kicking into life and hey presto! Nothing particularly exciting

happens at all. In fact all you get is a version number, a copyright message, a TPA size, and the letter 'A' followed by a little prompt 'C'. Fantastic! Stupendous! Incredible! What happens next? Who cares?

### But What does it do?

When you see the prompt, it is telling you three things. Firstly, that the drive you are using is drive A. That you are logged on as user zero, and that the C.P. is waiting for input from you. What do those terms mean? Well, CP/M drives are designated by letters from A to P, and you have a drive that all disk operations happen to unless you specify a different one. This is called the default drive. In CP/M the default drive always starts off as 'A'. In the CP/M disk system on the C128 the attached disk drive is always 'A', but it also has a 'RAM Disk' assigned to 'F', this is an area of memory that behaves just like a disk drive. This is to help you with disk copping etc. More about this later.

The user number is a way of keeping 16 different directories on the disk at once. Perhaps you will have WP files on one, Basic programs on another, and a database on another one. These are called user numbers and can be from zero to 15. Like the default drive, CP/M has a default user number. This starts off as zero. If the user number is changed to get at another directory, you will still be able to get at User zero, this works like a global directory that can be accessed by all the others.

If you change the default drive then the display may look like this "B>" - indicating drive B, and if you change the User number it could look like this "A0>" - indicating User four.

Now the CP/M system is waiting for your input. This is very much similar to the Basic/Ready prompt. It means that the current operation is finished and it is waiting for a new one. From here you can type in commands to make CP/M do things.

In CP/M there are two types of command - resident and transient. Resident commands are the ones built into the system. Transient commands are loaded off disk before they are executed. It is these transient commands that take up most of the CP/M system disk.

## So, What Happens Next?

The resident commands are fairly simple and are detailed as follows. You can change the default drive by typing in the new letter followed by a colon. So to change to drive 'C' you would type in 'C'. User numbers can be changed by typing in 'USER n', where 'n' is the new number. DIR displays a directory of disk contents, sorted into alphabetical order, following it with a drive letter and a colon will directory that drive. No letter and the default drive gets it. REN will rename a file. ERA will erase a named file. TYPE will display a named text file on the screen. And DIRSYS will display the system files in a similar manner to DIR. System files are files that are usually loaded in when CP/M is booted and do not normally appear in the directory. This command forces them to be displayed.

These commands also have transient versions. These are extended versions of the commands, whilst due to memory space the built in commands perform only the basic function. Remember that these commands must be present on a disk in the drive for them to function.

DIR, DIRSYS commands can now have a fileoper after them using the CP/M wild card system. This wild card system is identical to the Commodore one. In that a "?" stands for any letter, and a "\*" stands for anything else in the filename - but remember the file extension that must be specified in all CP/M operations (similar to the PRG, SEQ, USR labels on Commodore disks). So

typing in 'DIR PREFIX.\*' will list all files beginning with 'PREFIX', or 'DIR \*.COM' will list all command files. Including a drive letter followed by a colon before the fileoper will direct CP/Ms (unless to that drive. Hence 'DIR B:\*.BAR' will list all backup files on drive B. You can use multiple fileopers.

You may also include an options list after the fileoper. The options list is a list of commands enclosed in square brackets and separated by commas. These tell CP/M that something out of the ordinary is to be done with the directory listing. Options are as follows:

ATT - Displays user defined file attributes (don't worry about this - it's of absolutely no use what so ever.)  
DATE - Displays the date and time that the file was last changed. Date stamping must have been initialised previously though.

DIR - Only displays files that have the 'DIR' attribute.

DISK=ALL DRIVE=ALL - (either will do) Displays files on all available drives.

DRIVE=(A,B,C) - Displays directory from specified drives only.

DRIVE=A - Only from drive specified.

EXCLUDE - Displays all files except the files specified.

FF - Sends a form feed before listing out the directory. Only useful for printers.

FULL - Displays masses of status information about the file as it is displayed - how long in Kilobytes, how many 128 byte records it takes up, the password protection mode, and the date/time stamps.

LENGTH=n - Outputs 'n' blank lines before printing the directory, mainly used for printers again.

MESSAGE - Give out status information as CP/M searches various drives etc. Gives you something to watch whilst it's all happening.

NOPAGE - Overrides the CP/M paging system.

NOSORT - Displays files in the order that they are found rather than alphabetically sorting them.

RO - Displays only files that have the read only attribute set.

RW - Displays only files with the read/write attribute set.

SIZE - Shows the length in K of the files.

SYS - Displays only system files.

USER=ALL/USER=n, USER=(A,B,C) - Similar functions to 'DRIVE' except

refer to the 16 user numbers.

Device redirection is a very delicate piece of software. Say you wanted to RS232 interface to be your printer output rather than the normal print. When you can then also use to set printer output to the RS232 interface simple. But, how do you do it?

As well as all these logical devices CP/M also has physical devices. These are:

CRT - Screen.

CRT2 - Keyboard.

LPB - Printer.

IO\$ - RS232.

NULL - Nothing (used for turning something off).

To alter the direction of something you simply assign it, in our example earlier: 'DEVICE LST=IO\$'. This will set up a default printer output to go to the RS232.

Almost any device can be assigned to any other device with a few exceptions that are handled by the transient commands GET and PUT. So a could quite easily attach a terminal to the computer, type in 'DEV CON=CON'. And the computer suddenly being operated by remote control. 'DEVICE CON=CRT' change it back to normal.

You can also change option codes with this command. Change the screen has been discussed earlier. But as far as the RS232 interface concerned DEVICE AUXIN[NO 680] will set the RS232 interface up to the non protocol and 680 bit. Various baud rates are accepted as NOW/NOCON controls the hand shaking. These options can be included in the same statement as assignment, and multiple assignments are also allowed. So 'DEVICE LST=IO\$;NOW680,14280;CON=CRT' is acceptable.

FORMAT - This is the transient command to format a CP/M disk prior to use. Type in 'FORMAT' and then file instructions.

INITDIR - This command organises the disk directory slightly to allow date/time stamping. This is that whenever a file is written to, its time and date when this happens recorded - but remember to set a date using the DATE command or your system will use the date when CP/M was written!

SAVE - Will save a program memory to disk - not for the user. SET - This is a very powerful an

mond that lets you set a number of attributes for a file or group of files. The SET command basically works in three ways. The first is just setting the attributes as mentioned before. **SET "BAK|RO|A|YS"** will change all backup files to read-only and system files. This can be used with any of the R|O|W|S|E|D|H|E attributes.

You may have noticed the word "attribute" appearing above. This refers to certain characteristics that can be set in a file. RO and RW set the files read-only or read/write depending, and will prevent the modification of a file. SYS will turn a file into a system file, and DIR enables directory listing. These attributes will be discussed later in the "SET" command which is the command used to change files.

The transient versions of ERA, TYPE, and REN are not nearly as complex as DIR. They merely allow the use of floppies rather than disks, erase all backup files on drive B, and has no transient equivalent.

## Now What?

Now the fun starts. On your system disk you will find a good few programs. Most of them are transient commands, but a few of them are better considered as discrete programs.

First let us consider the "quickly" commands. These are accessed in the same way as the resident commands, by just typing them in. The only difference is a slight delay before they take effect due to their being loaded off disk.

**DATE** - Sets or displays the date and time, and for date stamping of CP/M files when enabled (see EDITOR). To display the date use **DATE**, or to have a continuous display of date and time use **DATE CONTINUOUS** or **DATE C**, to set the date use **DATE SET**.

**DUMP** - Displays a hex dump of a word file.

**GET** - Gets console input from a disk file rather than from the keyboard. Rather like the BBC micro's EXEC command.

**PUT** - Writes everything that would have gone to the screen into a disk file named, rather like "SPool" or a BBC micro.

**PHYS** - This command allows you to set or change physical and logical

devices around, and set the characteristics for those devices. Device names are three letters long with a trailing colon. They may also have the suffix "IN" or "OUT" to change only that characteristic.

**CON\$(CONIN\$, CONOUT\$) -** is the console.

**DEVICE CON\$(COLUMNS=40, LINES=14) -** will set the size of the screen.

**DEVICE CON\$(PAGE) -** will display the current size.

**AUX\$(AUXIN\$,AUXOUT\$) -** is the auxiliary in/out usually attached to the RS232 interface.

**LIST: -** is the printer output name. It has no options.

The second function changes the drive attribute and name. The drive attribute is either RW or RO, in normal operation it is RW. **SET A[RO]** will stop you writing to that drive. In addition each disk can have a name conforming to the same rules as CP/M file names (i.e. eight letters and three letters). **SET A\$(NAME=) GAMES.BOX** will label the disk with that name.

The last function is used with the passwords system that CP/M+ uses. Firstly you can assign a password to the master disk. This will prevent anyone using the SET command on that disk at all. It takes the form **SET [PASSWORD]=mike** where "mike" is the password. To remove the password **SET [PASSWORD]=** is needed. Note that you need the password to get that far, and that you don't need the trailing bracket - Return will do.

To enable password protection on the files on a disk, the password system must first be initialized. **SET [PROTECT]=ON** will alter this.

To change or set the passwords the command takes on the syntax **SET FREQ\*.\* [PASSWORD=mike]** where "mike" is the password and **FREQ\*.\*** refers to any normal filespec.

Passwords can also be selectively used on certain functions, these are READ, WRITE, DELETE, NONE. One of these functions can be selected. READ affects everything so that you need a password for almost every access of the file.

WRITE needs a password for writing, renaming, or deleting. This allows the file to be read but not tampered with.

DELETE allows you to do

anything to the file except delete it or rename it. NONE turns off the password protection. The syntax is **SET WP-COM[PROTECT=READ]**.

Default passwords can also be selected. Say all the files on the disk had the password "mike". **SET [DEFAULT]=mike** would remove the need to type in the password every time a file was accessed. Normally the password has to be included in the filespec after a trailing semicolon. Say a file called "private.doc" with a password of "mike" was to be accessed, then the filespec would be "private.doc;mike".

The final function of the SET command is to alter the way that date stamping is used (assuming that date stamping has been initialized). The three options ACCESS, UPDATE, and CREATE are used. Access will stamp the file every time that you do anything with it, create only stamps it the first time you write it to disk, and update overwrites that you alter the file. Create and Access are mutually exclusive and having one on will turn the other one off. Syntax is **SET [UPDATE]=ON**.

**SHOW** will display certain information about the disk depending on the option list given. **SHOW** on its own or with a drive name will give you the read/write space remaining. **SHOW** with an option after it will perform one of the following functions:

**LABEL** - Will show the disk name, whether the disk is password protected, the stamp/create/update status, and the date that the disk name was created or updated.

**USERS** - Will list the active user numbers and their respective number of active files and free directory entries.

**DIR** - Displays the number of free directory entries.

**DRIVE** - Will output a comprehensive list of the characteristics of that drive.

So typing in **SHOW A[DIR]** will give you the number of free directory entries on drive A.

I think that wraps it up for this month. Next month I will be telling you about one or two special modifications made to the C128 version of CP/M like the virtual drive and the user defined keyboard. Also I will be detailing some of the really complicated commands, as well as explaining some of the more obscure concepts that CP/M uses. So if you are confused (I know I am) all will be revealed next month.

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2007 FEB 02

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**OMB No. 1545-0047**  
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**For a decedent who died in 2001**  
**OMB No. 1545-0047**

**Page 2 and 3** The caption for the first picture on page 2 reads "The first picture on page 2 reads 'The first picture on page 2 reads'".

1. The first step is to identify the problem. In this case, the problem is that the company is not meeting its sales targets.

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1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

**CALLING OF THE BELL**

18. The [redacted] will [redacted]





# Diskits 1, 2 and 3

*Here we start a series of very handy utilities written specially  
for disk users.*

*By Les Allan*

## DISKIT 1

Memory Saver is a useful routine aimed at saving all your machine's memory from \$0000 to \$FFFF. It is not intended to promote piracy, which may be the immediate conclusion which you leap to, because under commercial *Jeepers Privacy*, to name but one, the user can only work with material which is under his control. Without the knowledge of a start address it is of no use to you whatsoever.

## The Facts

Two machine code routines are located at \$0247 and \$050C which provide the means to save memory between \$0000 and \$FFFF. The program saves three files as follows:

1. Main part - from \$0001 to \$CFFF
2. Kernel - from \$D000 - \$CFFF

In order to make use of the kernel routines for saving etc, this part is relocated to \$1000 and then saved between \$1000 - \$4FFF.

3. Boot part - from \$0001 - \$4FFF

This part contains the character and kernel RAM which is saved between \$000 - \$4FFF. Two c/s routines are included to perform the following:

- (a) relocates the character/kernel ram to \$D00 - \$FFFF
- (b) loads in the MAIN file and then runs it.

OK, so how do you go about using it?

Point number one is that you must know the start address of the program or you're lost before you start.

## Instructions

1. Load in the program to convert into two parts
2. Press reset switch if required (Quickdisk preferred).
3. Load "MEM1", 8,1.
4. Load "MEM2", 8,1.
5. Type in Basic SYS call  
i.e. 10 SYS\$004 (if that's the start address, of course). A JMP... command can be used to replace the RUN command in the DISKIT file but you will need to use a m/c monitor or disk monitor to do this.
6. SYS 828 to save memory.
7. The two files \$0001 and MAIN are now a complete working copy which can be individually crunched to save working space.
8. If, when the MAIN part is crunched, it crunches to less than 150 blocks then the \$0000 part \$1000 can be appended to this.

Remember that it is illegal to pirate software so this routine is for use with your own software!

The program as listed must be typed in exactly as written and saved prior to running. Error trap routines are included to ensure that the data as read is correct. The program when run stores the relevant code at a temporary address of \$0000 and when prompted relocates the working programs to Basic, where start area and the cassette buffer and saves the programs to disk.

## DISKIT 2

When programs are saved to disk very often there is a considerable duplication of adjacent data in memory which can be compressed by the use of a code compressor.

This Turbo-Cruncher will work with either Basic or machine code programs providing that the program resides in memory from between \$0000 and \$D000.

The utility provides the user with the facility to view the directory with the F1 key or go straight to the crunched with the F7 key. The program is then read in at turbo rate, common code compressed and saved back to disk at turbo rate prefixed with a '+'.

The skill of the user will determine the results that are available but it is possible to fit memory with common code. SEA for example, load in the machine code to memory and finally add a Basic boot to provide a single file that may exist between \$0000 and \$D000. The finished file can then be Turbo-Crunched to produce a single working routine which could be as small as 17 blocks which, considering the saved file was 260 blocks represents a considerable saving of disk space.

Remember that it is illegal to pirate software so make sure that you only do this to your own programs!

The program must be typed in exactly as written and saved prior to running. Error trap routines are included to ensure that the data as read is correct. The program when run stores the relevant code at a temporary address of \$0000 and when prompted relocates the working program to Basic (\$0000) and saves the program to disk.

## DISKIT 3

This machine code program resides in the cassette buffer at \$0247 and enables a program to be made into a part from the files called "MAIN" and "KERN".

The program works by taking its results from the MEMORY Saver routine which creates three files 'MAIN', 'KERN' and 'BOOT'. It then the MAIN file is Turbo-Crunched the total length of the file



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69	126	DATA 18,18,20,27,27,27,27	70	744	DATA 27,27,27,27,27,27,27	71	191	DATA 18,18,20,27,27,27,27,27
70	127	DATA 18,18,20,27,27,27,27	71	745	DATA 27,27,27,27,27,27,27	72	192	DATA 18,18,20,27,27,27,27,27
71	128	DATA 18,18,20,27,27,27,27	72	746	DATA 27,27,27,27,27,27,27	73	193	DATA 18,18,20,27,27,27,27,27
72	129	DATA 18,18,20,27,27,27,27	73	747	DATA 27,27,27,27,27,27,27	74	194	DATA 18,18,20,27,27,27,27,27
73	130	DATA 18,18,20,27,27,27,27	74	748	DATA 27,27,27,27,27,27,27	75	195	DATA 18,18,20,27,27,27,27,27
74	131	DATA 18,18,20,27,27,27,27	75	749	DATA 27,27,27,27,27,27,27	76	196	DATA 18,18,20,27,27,27,27,27
75	132	DATA 18,18,20,27,27,27,27	76	750	DATA 27,27,27,27,27,27,27	77	197	DATA 18,18,20,27,27,27,27,27
76	133	DATA 18,18,20,27,27,27,27	77	751	DATA 27,27,27,27,27,27,27	78	198	DATA 18,18,20,27,27,27,27,27
77	134	DATA 18,18,20,27,27,27,27	78	752	DATA 27,27,27,27,27,27,27	79	199	DATA 18,18,20,27,27,27,27,27
78	135	DATA 18,18,20,27,27,27,27	79	753	DATA 27,27,27,27,27,27,27	80	200	DATA 18,18,20,27,27,27,27,27
79	136	DATA 18,18,20,27,27,27,27	80	754	DATA 27,27,27,27,27,27,27	81	201	DATA 18,18,20,27,27,27,27,27
80	137	DATA 18,18,20,27,27,27,27	81	755	DATA 27,27,27,27,27,27,27	82	202	DATA 18,18,20,27,27,27,27,27
81	138	DATA 18,18,20,27,27,27,27	82	756	DATA 27,27,27,27,27,27,27	83	203	DATA 18,18,20,27,27,27,27,27
82	139	DATA 18,18,20,27,27,27,27	83	757	DATA 27,27,27,27,27,27,27	84	204	DATA 18,18,20,27,27,27,27,27
83	140	DATA 18,18,20,27,27,27,27	84	758	DATA 27,27,27,27,27,27,27	85	205	DATA 18,18,20,27,27,27,27,27
84	141	DATA 18,18,20,27,27,27,27	85	759	DATA 27,27,27,27,27,27,27	86	206	DATA 18,18,20,27,27,27,27,27
85	142	DATA 18,18,20,27,27,27,27	86	760	DATA 27,27,27,27,27,27,27	87	207	DATA 18,18,20,27,27,27,27,27
86	143	DATA 18,18,20,27,27,27,27	87	761	DATA 27,27,27,27,27,27,27	88	208	DATA 18,18,20,27,27,27,27,27
87	144	DATA 18,18,20,27,27,27,27	88	762	DATA 27,27,27,27,27,27,27	89	209	DATA 18,18,20,27,27,27,27,27
88	145	DATA 18,18,20,27,27,27,27	89	763	DATA 27,27,27,27,27,27,27	90	210	DATA 18,18,20,27,27,27,27,27
89	146	DATA 18,18,20,27,27,27,27	90	764	DATA 27,27,27,27,27,27,27	91	211	DATA 18,18,20,27,27,27,27,27
90	147	DATA 18,18,20,27,27,27,27	91	765	DATA 27,27,27,27,27,27,27	92	212	DATA 18,18,20,27,27,27,27,27
91	148	DATA 18,18,20,27,27,27,27	92	766	DATA 27,27,27,27,27,27,27	93	213	DATA 18,18,20,27,27,27,27,27
92	149	DATA 18,18,20,27,27,27,27	93	767	DATA 27,27,27,27,27,27,27	94	214	DATA 18,18,20,27,27,27,27,27
93	150	DATA 18,18,20,27,27,27,27	94	768	DATA 27,27,27,27,27,27,27	95	215	DATA 18,18,20,27,27,27,27,27
94	151	DATA 18,18,20,27,27,27,27	95	769	DATA 27,27,27,27,27,27,27	96	216	DATA 18,18,20,27,27,27,27,27
95	152	DATA 18,18,20,27,27,27,27	96	770	DATA 27,27,27,27,27,27,27	97	217	DATA 18,18,20,27,27,27,27,27
96	153	DATA 18,18,20,27,27,27,27	97	771	DATA 27,27,27,27,27,27,27	98	218	DATA 18,18,20,27,27,27,27,27
97	154	DATA 18,18,20,27,27,27,27	98	772	DATA 27,27,27,27,27,27,27	99	219	DATA 18,18,20,27,27,27,27,27
98	155	DATA 18,18,20,27,27,27,27	99	773	DATA 27,27,27,27,27,27,27			





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# Nursery Rhyme Land

*Adventure games are a useful asset to education via a computer. Here we bring you the graphics for our own educational game.*

*By Margaret and Allen Webb*

**T**here's nothing that enhances an adventure game so much as some eye-catching graphics, providing that available memory allows for this indulgence.

Our Nursery Rhyme Land game is aimed at the very young and so the graphics have additional importance in keeping the interest going and also aiding recognition of locations.

In the February issue of *Four Commodore*, we brought you the ladder for the test part of this game. This month—in the final part—we are providing the graphics drivers.

## Getting in the picture

The method of creating a binary file is as follows:

1. Turn on or cold reset your 64.
2. Enter this line in direct mode:

**POKE 44,0:POKE 80,256:NEW**

3. Load and run Listings 3, 4 and 5 (in that order).

4. Load and Run Listing 2. Save the block starting at 8192 and finishing at 17176. Listing 1 (PC Feb 87) assumes that the file is called **PC17176.BLOCK**.

5. If you have already tried the second part of the adventure on its own, don't forget to reset line 40 of the adventure header so that given in Listing 1 (PC Feb 87).

### Graphics, Listing 3

```

10 1:POKE 44,0:POKE 80,256:NEW
20 2:POKE 44,0:POKE 80,256:NEW
30 3:POKE 44,0:POKE 80,256:NEW
40 4:POKE 44,0:POKE 80,256:NEW
50 5:POKE 44,0:POKE 80,256:NEW
60 6:POKE 44,0:POKE 80,256:NEW
70 7:POKE 44,0:POKE 80,256:NEW
80 8:POKE 44,0:POKE 80,256:NEW
90 9:POKE 44,0:POKE 80,256:NEW
100 10:POKE 44,0:POKE 80,256:NEW
110 11:POKE 44,0:POKE 80,256:NEW
120 12:POKE 44,0:POKE 80,256:NEW
130 13:POKE 44,0:POKE 80,256:NEW
140 14:POKE 44,0:POKE 80,256:NEW
150 15:POKE 44,0:POKE 80,256:NEW
160 16:POKE 44,0:POKE 80,256:NEW
170 17:POKE 44,0:POKE 80,256:NEW
180 18:POKE 44,0:POKE 80,256:NEW
190 19:POKE 44,0:POKE 80,256:NEW
200 20:POKE 44,0:POKE 80,256:NEW
210 21:POKE 44,0:POKE 80,256:NEW
220 22:POKE 44,0:POKE 80,256:NEW
230 23:POKE 44,0:POKE 80,256:NEW
240 24:POKE 44,0:POKE 80,256:NEW
250 25:POKE 44,0:POKE 80,256:NEW
260 26:POKE 44,0:POKE 80,256:NEW
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810 81:POKE 44,0:POKE 80,256:NEW
820 82:POKE 44,0:POKE 80,256:NEW
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870 87:POKE 44,0:POKE 80,256:NEW
880 88:POKE 44,0:POKE 80,256:NEW
890 89:POKE 44,0:POKE 80,256:NEW
900 90:POKE 44,0:POKE 80,256:NEW
910 91:POKE 44,0:POKE 80,256:NEW
920 92:POKE 44,0:POKE 80,256:NEW
930 93:POKE 44,0:POKE 80,256:NEW
940 94:POKE 44,0:POKE 80,256:NEW
950 95:POKE 44,0:POKE 80,256:NEW
960 96:POKE 44,0:POKE 80,256:NEW
970 97:POKE 44,0:POKE 80,256:NEW
980 98:POKE 44,0:POKE 80,256:NEW
990 99:POKE 44,0:POKE 80,256:NEW
1000 100:POKE 44,0:POKE 80,256:NEW

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[illegible]

YOU ARE STANDING AT A CROSSROADS. A  
YELLOW ROAD LEADS TO THE SOUTH  
A RED ROAD LEADS TO THE EAST.  
A SIGN SAYS "HAPPY" CASE.

NAME	AGE	LAST	MR	WHITE
JOHN	25	JOHN	MR	100
JANE	25	JANE	MR	100
JOHN	25	JOHN	MR	100

YOU MAY GO TO THE  
NORTH EAST SOUTH WEST



YOU ARE CARRYING  
A SILVER BELL-A BOTTLE.





[illegible]

[illegible]

## THE TEXT

A world of information  
at your fingertips.

The document also reports that over 100 of its 120 pages are misquoting "English" sources, giving an "astonishing number" of errors of the sort that plague from *Le Monde* to *Chicago*. However, the book is based on British's changes. Further, it is not a good guide to any particular time, whether in the past or in the future. The document is a good guide to the past, but it is not a good guide to the future.

It is important to recognize that the results of this study are not generalizable to all populations and groups. The study was conducted in a specific context and with a specific sample, and the results may not be applicable to other populations or groups. Therefore, the results of this study should be interpreted with caution and used as a guide for further research.

Designed with a standard 19" adapter, it allows you to easily use the rear panel of the PlayStation 2. A convenient hand grip with "PS/2" buttons of the video controller. The standard design of the device allows to use standard, popular controllers to play on the console. With a wide range of accessories, you can use the console.

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1. *Journal of the American Medical Association*, 2000; 283: 2686-2692.

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# Popper

*On a light-hearted note, we bring you a game featuring  
Pamper the pucca pea. Have fun!*

486 *Reviews*

**A**s Pepper the popping pea you must explore the sixty-four rooms of each of the Green Giant's castles in search of the Pepper juniors that he has kidnapped.

Each castle has eight floors, each right rooms wide and on each floor you will find a jarred Pepper. When you have found all eight Peppers in each castle you must put them back into their nest.

However life is not all that easy because the Green Giant has some major hurdles to hinder your progress.

To get from one floor of the castle to another you must pop through a hole in the floor, but make sure that you have found the Popper junior on that floor because there is no way back up again. Because of multiple holes positioned beneath each other because you will be unable to find all the Popper juniors and put them in their nest.

When you get all the Poppers in the pool go on to the next castle to rescue even more poppers from the clutches of the Green Giant.

### Controls for Age

To move Pepper about the maze use a joystick in port 2. Press fire to start a game and push left and right to guide Pepper.

To load Popper, press Shift and Run/Stop and press PLAY on the tape deck. The game will load and run automatically.

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To type in the game, please use the *Four Commodore Hex Data Entry Program*. Check the Contents page to find out exactly where it is in this issue.

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# Contributions

*So you own a Commodore? So you've written some programs? So why haven't you sent them to us?*

**Y**our Commodore is always on the look out for new programs, hints and tips, articles and even regular series. In fact if you have something that you think could be of use to other Commodore owners we want to hear about it.

So if you have got something which you think we may be interested in, how do you go about submitting it to us?

Below you will find a list of guidelines that will help us to deal with any item that you send in to us. We don't expect everybody to be the next William Shakespeare but if you do follow these simple rules then it will make our job a lot easier.

1) If possible all material sent to the magazine should be typed or printed out on a computer printer.

2) All text should be double spaced i.e. there should be a blank line between each line of text. You should also leave a margin of about 10 characters around the text.

3) On the very first page you should put the following:

Name of the article  
Machine that it is for  
Any entries required - disk, printer etc.  
Your name  
Your address  
Your telephone number

4) The top of every page should have the following information on it:

Abbreviation of the article title  
Your name  
The page number

For example, suppose you had submitted an article on C64 interrupts. You should put something like the following at the head of the page:

Interrupts/J.Smith/1

5) Please make sure that you do not make any additional marks on your text especially underlining.

6) Try and write in clear concise English, it does not have to be a work of literature but it must be comprehensible.

7) On the bottom of each page you should put the word MORE if there are more pages to the article or ENDS if it is the last page.

8) If possible, enclose a listing of all programs.

9) Under no circumstances are a staple to hold the pages together. Use a paperclip instead.

10) Programs should be included on either disk or tape. Make sure that you SAVE two copies of every program so that we have a better chance of loading them if problems occur.

11) Programs under 10 lines can be included in the text. If your program is longer than this you must enclose a disk or cassette.

12) If your article needs any artwork then supply clear examples of what is needed. We don't expect you to be an artist but we do need to see what is required.

13) Photographs, if necessary, must be either black and white prints or colour slides. We can take them ourselves so don't worry about this too much.

14) Submissions of any length are welcome. If you have a five line routine that you think may be of use to someone else we welcome it just as much as a full blown six part series.

15) Payment varies quite a lot and depends on quite a number of factors, such as complexity of program, presentation of program, number of magazine pages it takes up etc. Payment is generally between £10.00 and £200.00.

16) All payments are made in the month that the magazine containing your article has appeared in print.

17) If we do find your submission suitable for inclusion in the magazine we will write to you giving the terms of publication, the rate of payment and an agreement form. Prompt return of this form will allow us to use your program as soon as possible.

18) If you want the program returning to you, should we find it unsuitable for publication, then you should enclose a stamped self addressed envelope.

19) The last and most important point to make is 'get writing', we are waiting for your articles.

# Pirate Power

*If you're a Basic programmer looking for new tools then this Basic Extension from Pirate Software may be just what you're after.*

By Evelyn Mills

**E**xtension 64 is a program which will extend your Basic into a form which is both compact and efficient. Naturally you will require to restructure your ideas on programming, but commands have been streamlined to an extent which is quite remarkable. To select a random example from the 120 or so extra commands available, "STIX L" will give a joystick response on both the x and y axes.

On loading you will find that you have 36-plus K available for programming, the whole being entirely compatible with standard Basic if you wish. Effectively, Extension 64 is primarily intended to enable you to manipulate sprites and music with greater ease and this is most certainly done. There are, of course, many other useful features but these are the two which should impress you most.

You may be daunted by the Manual, however demos are available on both cassette and disk and, if you follow the MAZE Demonstrating through in the supplementary listing provided, you should get to grips with this incredibly simple program structure. Plenty of examples are provided in the Manual and the cross-references are good.

## Sprites

So what does all this do? SPRITES may be animated with a one line command, while boundary limits can be set to bounce your sprites around in a variable fashion. Up to 64 sprites

may be displayed on the screen at any one time, working on a basis of seven sets and eight sprites. I would recommend that one set is sufficient for starters. Sprites may be rotated, flipped around, made to 'chase' each other (FLIE command!) or halted (HALT!).

In the event that you do not have a sprite generator, there is an excellent one provided which operates via keyboard or joystick. The SPRIGEN (generator) has a very good screen display, allows for flipping, multi-colour display and saves the data to tape or disk for recall if required. Data files may be created in this way. All of the functions and displays are well documented in the Manual; please take note of how to reload your sprite data!

## Music

Now to MUSIC. In the demo section you will find a program called ROUND. The tone and quality of the music is excellent; let this demo run on until the music has finished and you will find a 'keyboard' with three Beagle Rhythms incorporated which can give you a lot of fun - full screen directions here.

To program music however, back to the manual: the main references to head for here are VOICE and PLAY; these sections contain full data on how to control waveform, modulation, frequency, synchronisation etc. To find out how to program each data and to output a one or three voice melody, again refer to the demo program. You

will be surprised at the simplicity of operation.

## Other Features

Now to the CHIRGEN or character generator. This is a fairly standard procedure for redefinition of characters (lower and compact) and a full set of redefined characters may be stored and reloaded for further programming.

Hi-res graphics are not forgotten; line drawing, circling and boxing are all present, with a choice of modes, colour, and pen. There are full instructions for a SPLIT SCREEN mode allowing multicolour bit map graphics and text to be used together.

I did say that there are over 120 commands - look up the Quick Reference Index and you will find them there - Print as, Color as, Shrink, Scroll, Rotate to a line number (very useful), Screen blanking, Auto-numbering, Block deletion etc. Some things old and a lot new.

The most impressive feature of EXT-64 is its compactness of commands: use it in conjunction with Basic and you have here a very powerful programming tool indeed to give you maximum effect with minimal effort. Remember that this a programmer's program.

## Features

**Program:** Extension 64. **Company:** Pirate Software, 24 Badger Lane, Engleby, Barnold, Scarborough-On-Tees, Cleveland. Tel: 0642 762140. **Price:** £2.95 tape, £9.45 disk, £12.95 cartridge.

# Bare Facts

*Inside the Commodore range of computers there are a variety of machine code routines that are available to the user. We look at what they are and how to use them.*

Whenever any action is taken on a Commodore computer an internal machine-code routine actually handles the action. For example there is a routine in the computer that prints out the character in the A register to the current output device.

All of these routines sit in a Read-Only Memory (ROM) inside the computer called the Kernel. These routines are therefore referred to as Kernel Routines.

Commodore, in infinite wisdom, has placed the routines on each of their computers in the same area of memory, obviously not all machines have the same routines, but where they are the same they sit at the same place. Knowing what these routines do and where they sit in the computer's memory is extremely important when writing machine-code programs or transferring a program from one machine to another.

Before you will find a complete list of all the major Kernel routines. This should aid you in writing your own machine-code programs and converting from one machine to another.

## ACPTR

Purpose: Get a byte from the serial bus.  
Call address: \$FFA5  
Output parameter: A  
Machines: All

Whenever you wish to get data from the serial bus this is the routine to use. This routine gets a byte of data and places it in the A register. Before using this routine the TALK routine must be used to tell the device on the serial bus to send data. If the input device requires a secondary command you must send this with the TALK routine before using this one.

## BOOTCALL

Purpose: Boot the disk.  
Call address: \$FFD3  
Input parameter: X  
Machines: C128

When called this routine will boot any auto-start disk that is in the drive. The X register should contain the device number of the drive.

## C64 MODE

Purpose: Enable the C64 mode

Call address: \$FF4D  
Machines: C128

A call to this routine causes a C128 in C128 mode to switch into C64 mode.

## CHKIN

Purpose: Open a channel for input.  
Call address: \$FFC9  
Input parameter: X  
Machines: All

This defines a logical file for input. The file must have already been opened by using the OPEN Kernel routine. If you are wanting to receive data from somewhere other than the keyboard then this routine must be called before using CHRIN or the GETIN routines. Should you be using the keyboard then the calls to this and the OPEN routine are not required.

## CHROUT

Purpose: Open a channel for output.  
Call address: \$FFC9  
Input parameter: X

Similar to the above routine, however, this time the OPEN file is set up for output. This routine is used before outputting data to any device, unless it is the screen.

## CHRIIN

Purpose: Get a character from the input channel.  
Call address: \$FFCF  
Output parameter: A  
Machines: All

This routine gets a byte of data from a channel already set up as the input routine by using the routine CHKIN. If CHKIN has not been used then all input is expected from the keyboard. The data is returned in the accumulator.

## CHROUT

Purpose: Output a character.  
Call address: \$FFD2  
Input parameter: A  
Machines: C16, Plus/4, C64, C128

This routine sends the character in the A register to the current output device. The output device must have been set up using the OPEN and CHKOUT routines. If these have not been used the data is sent to the screen.

## CHKOUT

Purpose: Send byte over serial bus  
Call address: \$FFA8  
Input parameter: A  
Machine: All

This is the routine used to send data over the serial bus. Before you use this routine the LISTEN routine must be used to tell a device to get ready to receive data. Should the device use a secondary address then you should use the SECOND routine to send this.

## CINT

Purpose: Initialize video controller and screen editor  
Call address: \$FF81  
Machine: All

This routine initializes the video chips and the Screen editor. On the C128 the function keys are set to their default values and the 40/80 key is checked to see which mode the video chip should be in.

## CLALL

Purpose: Close all files  
Call address: \$FFE7  
Machine: All

A call to this routine will close all open files. A CLRCHN routine is also necessary to reset all I/O channels.

## CLOSE

Purpose: Close a specified file  
Call address: \$FFC3  
Input parameter: A  
Machine: All

This routine is used to close a file after it is finished with. The accumulator should be loaded with the number of the channel to be closed before calling this routine.

## CLRCHN

Purpose: Clear I/O channels  
Call address: \$FFCC  
Machine: All

Call this routine to clear all open channels and restore the Input/Output channels to their original default values. If any open channels are set up as serial then an UNTALK is sent first to clear the input channel or an UNLISTEN is sent to clear the output channel.

## GETCONF

Purpose: Get the configuration byte.  
Call address: \$FF6B

Input parameter: X  
Output parameter: A

A table at memory location \$FF6B is required for normal operation of the C128. The configuration index should be passed in the X register. The configuration is returned in the A register.

## DLCHR

Purpose: Copy the character ROM  
Call address: \$FF61  
Machine: C128

A call to this routine causes the character set to be copied into the video display chips internal memory.

## DMACALL

Purpose: Initialize external RAM components  
Call address: \$FF56  
Input parameter: X  
Machine: C128

When you require direct memory access to external memory it must first be initialized with this routine. The X register should contain the new configuration.

## GETIN

Purpose: Get a character  
Call address: \$FFE4  
Output: A  
Machine: All

If the input channel is the keyboard then one character is read from the keyboard queue and its ASCII value placed in the A register. No characters in the buffer places a zero in the A reg. If the input channel is serial, cassette or screen then use the CHBIN routine.

## INDCMP

Purpose: Compare the accumulator with memory in any bank  
Call address: \$FF74  
Input parameters: A, X, Y \$0028  
Output parameter: \$03

To compare the contents of the accumulator with the contents of a memory location in any bank you should put the configuration index in the X register and the offset in the Y register. Location \$0028 should hold the address of the zero page memory location that holds a pointer to the memory location that you wish to compare with.

## INDEFET

Purpose: Get a byte from any bank  
Call address: \$FF74  
Input parameters: A, X, Y  
Output parameter: A

This allows you to read the contents of an address in any configuration without having to change the actual memory configuration. A pointer must be defined in a zero page

location that points to the address to be read. The A register should contain this address. The configuration index is passed in the X register and the offset to the zero page pointer in the Y register. The result is returned in the A reg.

## INDSTA

Purpose: Store accumulator in any bank  
Call address: \$FFF7  
Input parameters: A, X, Y, \$0109  
Machine: C128

This routine will store the contents of the A register in any memory configuration. The A register should contain the character to be stored. The zero page address where a pointer to the memory address is stored must be placed in number and the Y register the offset from the location that is in zero page.

## IOBASE

Purpose: Define I/O memory page  
Call address: \$FFF3  
Output parameters: X, Y  
Machine: All

This routine sets the X and Y registers to the address of the memory section where the memory mapped I/O devices reside. You can then use this address with relative addressing to access the different ports in the necessary devices. The X register contains the low byte of the address and the Y register the high byte.

This routine provides a certain amount of compatibility between Commodore machines. If you call this routine and use relative addressing to address the registers in the I/O chips.

## IOINIT

Purpose: Initialize I/O devices  
Call address: \$FFFA  
Machine: All

This routine initializes all input/output devices and routines.

## JMPFAR

Purpose: Jump to any bank  
Call address: \$FFFD  
Input parameters: zero page 2 to 9  
Machine: C128

This routine enables a jump to another routine in any bank. Parameters are passed through memory locations 2 to 9.

## JSRFAR

Purpose: Jump to a subroutine in any bank  
Call address: \$FFFE  
Input parameters: Zero page 2 to 9  
Output parameters: Zero page 2 to 9

This routine is used to jump to a subroutine in any bank. The parameters are passed in memory locations 2 to 9.

## LISTEN

Purpose: Tell a device on the serial bus to listen  
Call address: \$FFB0  
Input: A  
Machine: All

This routine commands a device on the serial bus to get ready to receive data. The A register should be loaded with the device number before using this routine.

## LKUPLA

Purpose: Search in table for logical file number  
Call address: \$FF59  
Input parameter: A  
Machine: C128

This routine searches in the table for the device and secondary address of the logical file specified in the X register. If the file is found then carry is cleared. A register contains the file number, X holds the device number and Y holds the secondary address.

## LKUPSA

Purpose: Search for secondary address  
Call Address: \$FF9C  
Input parameters: Y  
Machine: C128

The specified secondary address (in the A reg) is searched for in the table of OPEN files. If the search succeeds the carry is cleared and the A register will contain the File Number and the X register the device number.

## LOAD

Purpose: Load from device  
Call address: \$FFD5  
Input: A, X, Y  
Machine: All

This routine LOADs data from the specified device. The Accumulator should be set to a zero if a LOAD is to take place or a one should you require a verify. If you OPEN the file with a secondary address of 0 the X and Y registers should contain the start address for the LOAD. If the secondary address is 1 then the data is LOADed into the zero memory that it was SAVED from.

Before you use this routine you must have called the SETLFS and SETNAM routines.

## MEMBOT

Purpose: Set bottom of memory  
Call address: \$FF9C  
Input parameters: X, Y  
Output parameters: X, Y  
Machine: All



This is used to set the bottom of memory. The lower boundary of the available memory is set with the two registers X and Y. X is the low byte of the address and Y the high. If the carry flag is set when a call is made to this routine the memory bottom is read and returned in the X and Y registers.

## MEMTOP

**Purpose:** Set the TOP of RAM  
**Call address:** \$FF96  
**Input parameters:** X, Y (carry clear)  
**Output parameters:** X, Y (carry set)  
**Machines:** All

When the carry is set the top of memory address is returned in the X and Y registers. If carry is clear the top of memory is set to the address in the X and Y registers, X is the low byte and Y the high.

## OPEN

**Purpose:** Open a logical file  
**Call address:** \$FFCD  
**Machines:** All

This is the routine used to OPEN a logical file. Once the file is set up you can then use it for either input or output. The SETLFS and SETNAM routines must be called before using OPEN.

## PFKEY

**Purpose:** Define a function key  
**Call address:** \$FF85  
**Input parameters:** A, X, Y  
**Machines:** C128

This is the routine to use if you are wanting to define a function key. The zero-page address that points to the text for the key should be placed in the A register. The X programmed and the Y register should contain the length of the string.

## PLOT

**Purpose:** Set cursor location  
**Call address:** \$FFFD  
**Input parameters:** X, Y (carry clear)  
**Output parameters:** X, Y (carry set)  
**Machines:** All

A call to this routine with the carry set will return the position of the cursor on the screen in the X and Y registers. X holds the row number and Y holds the column. Calling this routine with the carry clear will move the cursor to the screen position specified in the X and Y registers.

## PRINT

**Purpose:** Print out a message  
**Call address:** \$FF7D  
**Machines:** C128

All characters following this call are sent to the current output device until a zero byte is reached. The program then continues normally.

## RAMTAS

**Purpose:** Perform RAM test  
**Call address:** \$FF87  
**Machines:** All

This is the initialization routine that sets up the zero page etc. of the machine. This is sometimes called a warm start.

## RDTIM

**Purpose:** Read system clock  
**Call address:** \$FFD4  
**Output parameters:** A, X, Y  
**Machines:** All

This is used to read the system clock. Three bytes are returned by the routine. The A register contains the most significant byte. The X register contains the next most significant and the Y register the least significant.

## READST

**Purpose:** Read Status word  
**Call address:** \$FFB7  
**Output parameters:** A  
**Machines:** All

This routine returns the status of the I/O devices in the A register. This routine should be called and the status checked after the I/O operation.

## RESTOR

**Purpose:** Initialize the system vectors  
**Call address:** \$FF9A  
**Machines:** All

This routine sets up the default vectors for all of the computer's system and interrupt vectors.

## SAVE

**Purpose:** SAVE memory to a device  
**Call address:** \$FFD6  
**Input registers:** A, X, Y  
**Machines:** All

This is the routine to use if you wish to SAVE a section of memory. The device address, file name etc. must be set with the SETLFS and SETNAM routines. 128 owners must also set the bank with a call to SETBANK.

The zero-page address at which the start address of the area to be SAVEd is stored must be placed in the A register. The end address of the area is placed in the X (low) and Y (high) registers.

## SCANKEY

**Purpose:** Scan the keyboard

Call address: \$FF1F  
Machines: All

This routine scans the keyboard and checks for a keypress. This routine is called by the interrupt handler. If a key is pressed its ASCII value is placed in the keyboard queue.

## SCREEN

Purpose: Return screen format.  
Call address: \$FFED  
Machines: All (but not 128)  
Output parameters: X, Y

This routine returns the format of the screen. On a C64 this would be 40 columns in the X register and 25 lines in the Y register. This routine can be used to determine what machine your program is working on.

128 owners should note that this routine will get the size of the current screen window. After the call the X register contains the maximum column number. The number of lines in the Y register and the X register contains the number of columns.

## SECOND

Purpose: Send secondary address for LISTEN  
Call address: \$FF93  
Input parameters: A  
Machines: All

Use this routine when you wish to send a secondary address to an I/O device after issuing a LISTEN command. When sending a secondary address down the serial bus the address must first be OR'ed with \$08.

## SETRNK

Purpose: Define memory bank for disk operation.  
Call address: \$FF68  
Input parameters: A, Y  
Machines: C128

You should call this routine before performing a LOAD, SAVE, VERIFY and OPEN command. The configuration index of the filename should be placed in the Y register and the configuration index of the memory area to be processed should be in the accumulator.

## SETLFS

Purpose: Set up a logical file  
Call address: \$FFBA  
Input parameters: A, X, Y  
Machines: All

Use this routine to set the logical file number, device address and secondary address. The file number is passed in the A register. The X register should contain the device number and the Y register the secondary address.

## SETMSG

Purpose: Enable/Disable system messages  
Call address: \$FF90  
Input parameter: A  
Machines: All

This routine controls the printing of error and system messages. If bit 7 of the A register is set then error messages will be printed. If bit 6 of the A register is set then system messages will be printed.

## SETNAM

Purpose: Set up file name  
Call address: \$FFBD  
Input parameters: A, X, Y  
Machines: All

This is the routine to use when you are setting up a file name for the OPEN, SAVE or LOAD kernel routines. The A register should contain the length of the file name. The X and Y registers should contain the address in memory where the name is stored. X is the low byte and Y the high. 128 owners must also use the SETRNK routine to specify the bank to be used.

## SETTIM

Purpose: Set the system clock  
Call address: \$FFD8  
Input parameters: A, X, Y  
Machines: All

The internal 'jiffy' clock can be set by this routine. Before calling this routine the A register should contain the most significant byte, the X register should contain the next most significant and the Y the least.

## SETMO

Purpose: Set the time out flag for the IEEE  
Call address: \$FFA2  
Input parameter: A  
Machines: All

This routine saves the value passed in the accumulator in the timeout flag for the IEEE routines. Bit 7 of the accumulator should be set to 1 for timeouts to be effected.

## STOP

Purpose: Check if the STOP key is pressed  
Call address: \$FFE1  
Output parameter: Zero flag  
Machines: All

This routine checks to see if the STOP key has been pressed since the last IRQ call. If it has then the zero flag will be set. In addition the CHECK routine will be called.

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## Printer Winner

**T**he winner of our December competition was Gwynne Gibson, from Pity Me in Durham. He has won a Citizen 1760 Dot Matrix Printer worth £160 excluding VAT. A Commodore printer interface is also being included so that the printer is ready for immediate use. Congratulations Gwynne!

## Congratulations!

The first prize winner of the CRL Na-Wave competition was Brian Osborn of Kirkcaldy who received a superb package of a signed Tubular Bells album, a copy of the video and the computer program. The 29 runners up prizes of the program go to: D.J. Annett, Swindon; Henry Topham, Sliden Kighly; W.H. Cox, West Lym; Stephen Smith, Barnham; Mr P.G. Sullivan, Paineson; Ann Palmer, Statham; C.M. England, Cheshire Home; Tracy Roda, Poole; Mr R. Lucia, Harlow; Mark Winfield, Norrall Hill; Julian Faganini, Datchet; J. Harper, Belford; Mr R. Gillings, Portsmouth; Andrew Fairbrother, Printers-on-Sex; Ian Haffan, Hants; Peter Oxenden, Somerset; H.J. Mearns, The Netherlands; D. Derrick, Cheddar; Ian Horn, Colchester; Mr J. Gubben, Alphen; Mr D. Taylor, Isle Of Wight; Maureen James, Durham; Michael Treacy, Co. Limerick; P.A. Hardy, Farnborough; Stephen Holliday, Charley; Anthony Gills, Hove; Steve Skinner, Nottingham; Simon Thurman, Birmingham.



## Cups!

In our February issue, there were some confusing line numbers in the *Word Pro Aid On* article for the Plus/4. There was an assembly listing omitted from the article and although this is not necessary, when you want to type in and run the program, it may be quite useful to those of you who are interested in exactly how the program works. Therefore, if you want a copy of the listing, please send an a.s. to Word Pro Listing, Four Commodore, 1 Golden Square, London W1R 3AR.

Also in the February issue there is a stray character on two lines of *Adventure Aid Graphics* (p.98). The line should actually read:

```

100 IF (P=1) THEN GOTO C3-C3-1: END IF
-LOC: DE:CH:0010:00
END PRINT:END OF PROGRAM:END
1 - YELLOW, SPONGE, WHITE?

```

We apologise for any inconvenience which these slight errors may have caused to our readers.

## Hex Data Entry

We have had a number of calls from people who are having problems getting the [REV H] and [REV SN] in line 50. These should appear in the listing as a reverse H character and a reverse shifted N. In the LISTING article we explain how to get a [REV] character; follow the same procedure for these. It appears that a dot has disappeared in some copies of the magazine. Line 540 should have [LEFT], [LEFT] within the quotes.

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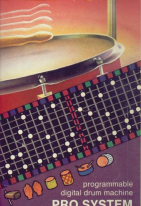
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